

Texas A&M University

DEPARTMENT OF AGRICULTURAL ECONOMICS

STRAWBERRY COWBOYS
AGRICULTURAL ECONOMICS
JULY 1974

November 25, 1981

Mr. Lowell Ketchum
Duncan, Oklahoma
73533

Dear Mr. Ketchum

Several years ago a group at Texas A&M University estimated the annual cattle losses that would occur in the absence of the screw-worm eradication program. States considered were California, Arizona, New Mexico, Texas, Oklahoma, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina and Florida. Their estimate that a 1.5% loss in U.S. beef production attributable to screw-worm infestations would occur in the absence of the program, seems conservative. Nevertheless we have used their estimates as a basis for determining economic benefits of the program.

Calendar 1980 is the latest full year for which appropriate data are available. In that year the per capita beef consumption on a carcass basis was 76.5 pounds. The retail price, also on the carcass basis, was \$2.38 with per capita expenditure on beef \$182.07. The Texas A&M estimates suggest a supply of beef, without the screw-worm eradication program, of 75.3 pounds per capita. USDA estimates suggest a 1.537 percent increase in the price of beef at the consumer level for each 1 percent decrease in supply. Using these estimates the estimated retail beef price in the absence of the program would have been \$2.44 or a per capita expenditure for beef of \$183.73.

Thus in the absence of the screw-worm eradication program, consumers would have expended an additional \$1.66 for beef but would have had 1.2 pounds, carcass basis, less available than was actually the case with the program.

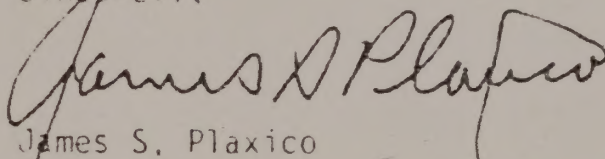
Given the 1980 estimated U.S. population in 1980 of 227.7 million, the total economic benefits of the program to consumers total \$377.9 million. USDA reports an expenditure of \$36.5 million on the screw-worm program in fiscal 1980, suggesting a cost benefit ratio of 10.4:1.

PAGE 2

Obviously the cost benefit ratio of the screw-worm program is highly favorable from the standpoint of consumers. It should be pointed out that in addition to suffering some \$378 million additional expense, consumers would have been forced in 1980 to forego the consumption of the additional 1.2 pounds of beef, carcass basis, if the program had not been operating.

The supporting calculation and data sources for the above estimates are included in the attached table. Bruce Bullock collaborated with me in making the calculations. If you have questions please call or write.

Sincerely,


James S. Plaxico
Professor

JSP:jgb

Enclosure

TABLE 1--ESTIMATE OF THE 1980 BENEFITS AND COST:
BENEFIT RATIO OF THE SCREW-WORM ERADICATION PROGRAM

ITEM	ACTUAL 1980	ESTIMATED 1980 WITHOUT SCREW-WORM PROGRAM
Per Capita Beef Consumption (Carcass Basis)	76.5	75.3 ^{1/}
Retail Beef Price (Carcass Basis)	\$2.38	\$2.44 ^{2/}
Per Capita Expenditures on Beef	\$182.07	\$183.73

Program Benefits:

Per Capita	\$1.66
Total	\$377,982,000
Cost/Benefit Ratio ^{4/}	10.4:1

-
- ^{1/} Livestock and Meat Outlook and Situation USDA LMS-243, Oct. 1981.
- ^{2/} Computed on the basis of estimated marketing reductions due to screw-worm infestations in the absence of the program.
- ^{3/} Based on a price flexibility of -- 1.537 from Livestock and Meat Situation LMS-229, Oct 1979, Page 25.
- ^{4/} Based on Fiscal 1981 expenditure of \$36,351,200 as reported to Senator Boren's office by USDA.

Funding for Screwworm Research
by ARS

(Mission, Texas and Tuxtla Gutierrez, Chiapas)

FY 1982	\$760,950.00
from the administrator	50,000.00
	\$810,950.00
FY 1981	648,049.00
FY 1980	750,700.00
FY 1979	668,300.00
FY 1978	771,000.00

I am satisfied that the review was adequate and the recommendations are proper. Thus, we cannot give further consideration or funding of the research you have proposed with the exception of the research on development of systemic age and sterility determination. We will follow through on the establishment of a technical committee for the study of potential reproductive isolation in screwworm populations.

Furthermore, we appreciated the opportunity to support some of your research in the past. You must, however, understand that with limited resources we must establish priorities and give support to that research that currently offers the greatest potential for contributing information that will lead to control or eradication of the screwworm.

Sincerely,

T. B. Riney

T. B. RINEY, JR.
Acting Administrator

Enc. 1/ copy of recording
and Turner
J. L. Riney
J. Riney, 1980
A. Riney
B. Riney
T. J. Riney

January 4, 1982

Dr. R. H. Richardson
The University of Texas at Austin
Department of Zoology
Austin, Texas 78712

Dr. J. R. Ellison
The University of Texas at Austin
Department of Zoology
Austin, Texas 78712

Dear Professors Richardson and Ellison:

This is a followup to my letter of December 14 regarding the review of the screwworm research that you have proposed. As I indicated in that letter, I asked Dr. Bram to reassess the review process and participants in order to make sure that he and other participants are satisfied that their recommendations are in order. A copy of Dr. Bram's response is attached.

I am satisfied that the review was adequate and the recommendations are proper. Thus, we cannot give further consideration to funding of the research you have proposed with the exception of the research on development of apodeme age and sterility determination. Dr. Bram will follow through on the establishment of a technical committee for the study of potential reproductive isolation in screwworm populations.

Gentlemen, we appreciated the opportunity to support some of your research in the past. You must, however, understand that with limited resources we must establish priorities and give support to that research that currently offers the greatest potential for contributing information that will lead to control or eradication of the screwworm.

Sincerely,

T. B. Kinney, Jr.

T. B. KINNEY, JR.
Acting Administrator

bcc: w/copy of incoming
Bud Turner

✓ R. Bram
N. Meyer, APHIS
A. Bertrand
H. G. Purchase
T. J. Army

1/6
srz 1/6/82



United States
Department of
Agriculture

Animal and
Plant Health
Inspection Service

RECEIVED JAN 12 1982

Subject: Larval Weights at Mission, Texas

Date: JAN 07 1982

To: O. H. Graham
USDA, ARS
Screwworm Research Laboratory
P.O. Box 986
Mission, Texas 78572

Enclosed is the information on the larval weights of the last four strains of screwworms reared at Mission. This data represents the mean weight of larvae for any particular month in production. Monthly weights were obtained by weighing a sample of larvae (100 larvae/sample) every 4 hours. All samples were taken from the water-larvae separator.

As I indicated to you during yesterday's telephone conversation, I have not been able to locate larval weight data for 009 while it was in Methods Development. I do recall, however, that the larval weights were generally in the 66-68 mg. range. If I find the data, I will forward it to you.

Lloyd Wendel indicated that he would provide you with larval weight data from Methods Development for Aracruz, DE9, and Sinaloa.

For additional information, I am also enclosing data on the times that the four strains were being mass produced.

If you require additional information, please do not hesitate to contact me.

D. D. Wilson
Principal Staff Officer
Technical Support
Animal Health Programs
Veterinary Services

2 Enclosures

Table 1 -- Monthly larval weights of four strains of screwworms reared at Mission, Texas ^{1/}

Month(s) in Production	Larval weights (mg) of indicated strain			
	009	Aracruz	DE9	Sinaloa
1	65.5	65.6	69.3	67.0
2	67.5	66.8	69.3	69.7
3	67.9	66.7	69.0	69.3
4	68.5	64.5	70.1	69.2
5	68.3	64.3	68.5	
6	67.7	62.2	67.6	
7	70.3	60.5	66.5	
8	68.6	61.2	66.3	
9	67.4	60.2	66.2	
10	66.0		65.8	
11	66.0		64.1	
12	67.5			
to				
34	62.8			

^{1/} Larval weights based on samples of larvae (100 larvae/sample) taken from the water-larvae separator every 4 hours

Table 2 -- Rearing history of four strains of screwworms
reared at Mission, Texas

Strain	Dates in Production	Total time in production (months)
009	Mar. 6, 1976-Jan. 9, 1979	34
Aracruz	Jan. 11, 1979-Oct. 13, 1979	9
DE9	Oct. 15, 1979-Sep. 14, 1980	11
Sinaloa	Sep. 15, 1980-Jan. 5, 1981	4

*Thank you
for the care and cooperation with APHIS
in all possible ways. Keep us posted as
events occur.*

*cc: J. R. Butcher
M. Carter
H. Brooks
J. Curry
Dr. J. H. G. - APHIS*

1/10/81

U.S. DEPARTMENT OF AGRICULTURE

TO

T. B. Kinney, Jr.

FROM

R. A. Bram

PART NUMBER

3

DATE

1/7/82

SUBJECT

Screwworms

MESSAGE

Dr. N. Meyer advised me this afternoon that workers in the screwworm production plant at Tuxtla Gutierrez, Mexico, are threatening to strike on January 28, 1982, if demands to declare their work "hazardous duty" are not met.

ARS is assessing its ability to maintain colonies of the V-81 and Arriaga screwworm strains in the event such a strike occurs. ARS will cooperate by maintaining colonies, if necessary, at the research facilities in Tuxtla Gutierrez, Mexico, Mission, Texas, and Fargo, North Dakota.

cc:

T. J. Army

H. G. Purchase

SIGNATURE

Ralph A. Bram

REPLY

*Thank you
Make sure we cooperate with NPHIS
in all possible way. Keep us briefed as
events occur.*

*cc AR Bertland
M. Carter
H. Brooks
T. Army
N. Meyer - APHIS*

SIGNATURE

T. J. Army

DATE

1/8/82

TELEPHONE LOG

DATE: 1-7-82 TIME: 3:30 p.m.

CALL FROM: (Name and Place) Dr. Meadows, Mexico City

CALL TO: Betty Liebe

PURPOSE OR REMARKS: They are expecting a strike at the Tuxtla plant

January 28 (three weeks hence). We are to get the plant, colony and
all back in readiness by that date. Can hire up to 15 temporary people
to check all systems, roof and walls for fly leaks, etc. whenever and
however to make sure it is ready by the 28th. If the strike happens,
pupae will be flown to Mission on 29th, 30th - etc.

Have Tom talk with Bill - get some place to put 21 cages (either fly
colony or methods area) - cages will be diverted from Albuquerque to
Laredo and held there in case they need to come to Mission instead of
to Tuxtla. The people hired can be any kind needed - welders, trained

FOLLOW UP INFORMATION: workmen (not just laborers) - might also need to get
some clerk types to help with T & A's, procurement, etc.

Talked with Ann Omelas, MN briefly, she said appointments should be temporary
NTE 1 year so that we can hire any grade, even GS's -- should be sure be hire
veterans with re-employment rights. Can hire whatever people will do the job
regardless of seniority, etc. (Need to be people who can do maintenance work
and then continue on to rear flies as needed, in some instances).

DATE: 1-7-81

SIGNATURE: Betty Liebe

RECEIVED JAN 14 1982
SPEED MEMO

U.S. DEPARTMENT OF AGRICULTURE

TO

T. B. Kinney, Jr.

FROM

R. A. Bram

Braham
PART NUMBER

3

Dr. Bram
DATE

1/7/82

SUBJECT

Screwworms

MESSAGE

Dr. N. Meyer advised me this afternoon that workers in the screwworm production plant at Tuxtla Gutierrez, Mexico, are threatening to strike on January 28, 1982, if demands to declare their work "hazardous duty" are not met.

ARS is assessing its ability to maintain colonies of the V-81 and Arriaga screwworm strains in the event such a strike occurs. ARS will cooperate by maintaining colonies, if necessary, at the research facilities in Tuxtla Gutierrez, Mexico, Mission, Texas, and Fargo, North Dakota.

cc:

T. J. Army

H. G. Purchase

SIGNATURE

REPLY

*Thank you
Make sure we cooperate with APHIS
in all possible way. Keep us briefed as
events occur.*

*cc AR Berzard
M. Carter
H. Brooks
T. Army
N. Meyer - APHIS*

SIGNATURE

DATE

(DESTROY THIS PART 3 UPON RECEIPT OF REPLY)

FORM AD 311 (REV. 11/79)



United States
Department of
Agriculture

Agricultural
Research
Service

National
Program
Staff

RECEIVED JAN 14 1982
Beltsville, Maryland
20705

January 8, 1982

SUBJECT: Technical Committee for the Study of Potential Reproductive Isolation
in Screwworm populations

TO: L. E. LaChance
MRRL, Fargo, North Dakota

Since the potential of reproductive isolation between screwworm populations in Mexico could be of critical importance to the further success of the screwworm eradication program, I wish to establish a technical committee of independent experts to study this question. I, therefore, request that you serve as chairman of such a committee in your capacity as National Technical Advisor for Insect Genetics.

As chairman of this technical committee, please prepare its terms of reference, develop all pertinent briefing materials, establish an itinerary and schedule of work, and appoint three prominent scientists of international stature to participate. When selecting scientists to serve on this technical committee, please consider including, if possible, one of the following who were recommended by Drs. R. H. Richardson and J. R. Ellison; Dr. Crodowaldo Pavan, Dr. M. J. D. White, Dr. Bruce Wallace, or Dr. Charles Michener.

I would recommend that arrangements be made with Dr. O. H. Graham to provide funding for this activity from resources of the Screwworm Research Project, Mission, Texas. Certainly, Dr. Graham and I are prepared to assist you in any way possible in order to assure the success of this most important assignment.

RALPH A. BRAM
National Research Program Leader
Insects Affecting Man & Animals

cc:

T. B. Kinney
T. J. Army
H. G. Purchase
E. L. Kendrick
P. J. Fitzgerald
J. R. Johnston
C. H. Schmidt
✓ O. H. Graham
C. J. Whitten
N. L. Meyer, APHIS



United States
Department of
Agriculture

Agricultural
Research
Service

National
Program
Staff

Beltsville, Maryland
20705

RECEIVED JAN 14 1982

January 8, 1982

SUBJECT: Technical Screwworm Conference

TO: M. J. Tillery
APHIS

Thank you for your memorandum of January 5 inviting me to participate in subject conference. Regrettably, a previous commitment during that entire week will preclude my attendance. However, I am pleased to advise you that Dr. O. H. Graham, Screwworm Research Project, Mission, Texas, and Dr. C. J. Whitten, Screwworm Project, Metabolism and Radiation Research Laboratory, Fargo, North Dakota, will represent ARS at this meeting. In fact, both of these scientists tentatively plan to arrive in Mexico City a day early to informally discuss technical aspects of screwworm research with Drs. Meadows, Hofmann, and other interested program officials.

I certainly hope to participate in the next screwworm technical meeting.

RALPH A. BRAM
National Research Program Leader
Insects Affecting Man & Animals

cc: w/cpy incoming

✓ O. H. Graham
C. J. Whitten



United States
Department of
Agriculture

Agricultural
Research
Service

National
Program
Staff

Graham
Beltsville, Maryland
20705

RECEIVED JAN 1 8 1982

January 8, 1982

SUBJECT: Distribution of FY 82 Funds - Screwworm Research

TO: E. L. Kendrick
Regional Administrator, SR

P. J. Fitzgerald
Regional Administrator, NCR

THROUGH: T. J. Army
Deputy Administrator, NPS *Is/ THOMAS J. ARMY*
H. G. Purchase *HGP 1/8/82*
Acting Chief, LVS

As a result of the gradual relocation of the screwworm research program from Mission, Texas, to Tuxtla Gutierrez, Mexico, and Fargo, North Dakota (see memo of April 7, 1981: "Future Screwworm Research Program" from Purchase, Levin, and Cowan), the Program Planning & Review Staff, Southern Region, requested NPS recommendations on distribution of FY 82 funds for screwworm research. As close as can be determined, funding at location is as follows:

1. <u>Mission/Tuxtla Gutierrez</u>	
WRU 20480	\$636,400
Location Support	<u>104,500</u>
TOTAL	\$740,900
2. <u>Fargo</u>	
WRU 20481 (D. Nelson)	\$100,000
WRU 20482 (J. Whitten)	<u>120,000</u>
TOTAL	\$220,000
3. <u>FY 82 Budget Increase</u>	\$187,300

GRAND TOTAL at Location FY 82 \$1,148,200

I, therefore, recommend the following at location distribution of funds to establish the FY 82 base:

Mission/Tuxtla Gutierrez ^{1/}	\$863,200
Fargo ^{2/}	255,000
Weslaco, TX ^{3/}	<u>30,000</u>

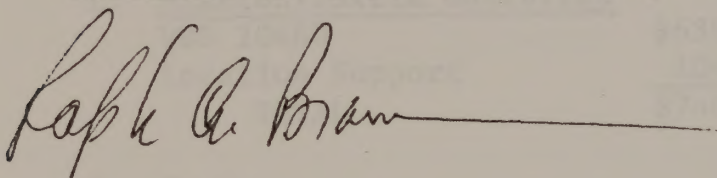
GRAND TOTAL at Location FY 82 \$1,148,200

To accomplish this, I would recommend that \$35,000 of the FY 82 budget increase be transferred to the Metabolism and Radiation Research Laboratory, Fargo, North Dakota; that \$30,000 be assigned to the Subtropical Products Chemistry Research Unit, Weslaco, Texas; and that the remaining \$122,300 be assigned to the Mission/Tuxtla Gutierrez Screwworm Research Project. These are, of course, at location figures.

1/ It is recommended that approximately \$15,000 of this amount be used to support the work of a technical committee under the chairmanship of Dr. L. LaChance (NTA for Insect Genetics) for the study of potential reproductive isolation in screwworm populations.

2/ When Dr. McInnis transfers from Mission to Fargo, a proportionate amount of his salary and support will accompany him and form the base for future funding.

3/ Dr. Harold Brown is preparing a CRIS unit for screwworm research on swormlure and SWASS enhancement; this represents 20% of his time.



RALPH A. BRAM
National Research Program Leader
Insects Affecting Man & Animals

cc:

J. R. Johnston
C. H. Schmidt
✓ O. H. Graham
H. E. Brown
L. E. LaChance
C. J. Whitten



United States
Department of
Agriculture

Science and
Education
Administration

Agricultural Research
North Central Region
Dakotas Area

Room 419
Federal Building Post Office
Fargo, North Dakota
58102

RECEIVED FEB 24 1982

January 18, 1982

SUBJECT: Comments on Distribution of FY-82 Funds for Screwworm Research

TO: Ralph A. Bram
National Research Program Leader
Insects Affecting Man & Animals
NPS, ARS, USDA
Room 211, B-005, BARC-West
Beltsville, Maryland 20705

We would like to make some comments to clarify your memorandum of January 8, 1982. We note that the location support funds are listed for Mission/Tuxtla Gutierrez, but they are missing for Fargo. So listed below are your amounts and next to them the current situation:

		<u>Revised Amounts</u>	
1. <u>Mission/Tuxtla Gutierrez</u>			
WRU 20480	\$636,400		\$636,400
Location Support	<u>104,500</u>		<u>104,500</u>
TOTAL	\$740,900		\$740,900
2. <u>Fargo</u>			
WRU 20481 (D. Nelson)	100,000	WRU 20481	104,300
		Location Support	30,600
WRU 20482 (J. Whitten)	120,000	WRU 20482	92,000
		Location Support	<u>28,000</u>
TOTAL	<u>\$220,000</u>		\$254,900

The revised figures indicate that Dr. Whitten does not have \$120,000 in his WRU as the amount shown above is only \$92,000 once the location support is taken out because unfortunately utilities are very high here. If he were to receive an additional \$35,000 as you suggest in 1982, \$8,400 of that amount would be used for location support, and the remainder of \$26,600 would be available to the project for a new total of \$118,400. So even with the additional \$35,000, Dr. Whitten would have less than you had indicated, i. e. \$120,000. If it were your intention that Dr. Whitten should have \$155,000 for his operating budget, then we would need an additional \$49,000. If you can find additional funds, they would be much appreciated. At any rate, we felt you should be aware of the current funding situation.

CLAUDE H. SCHMIDT
Area Director

cc:

E. L. Kendrick
P. J. Fitzgerald
T. J. Army
H. G. Purchase

J. R. Johnston
C. J. Whitten
O. H. Graham
L. E. LaChance



United States
Department of
Agriculture

Agricultural
Research
Service

National
Program
Staff

Beltsville, Maryland
20705

RECEIVED JAN 25 1982

January 18, 1982

SUBJECT: Techniques for Field Tests

TO: H. C. Hofmann
APHIS-VS, Mexico City

By memorandum on this subject of December 14, 1981, Mr. D. Hopkins requested that I comment to you on the proposed design of methods of testing screwworm strains. Certainly, Mr. Hopkins has given deep thought based on extensive screwworm experience to the design of testing methods. He should be commended for his unrelenting dedication to the program.

There are two major points which I feel require additional consideration and discussion before implementing this screwworm strain testing protocol:

(1) experience, most recently from the Arriaga test, indicates that an area of 25 Km² is too small for field evaluation; and (2) due to the natural fluctuations of wild populations, the interpretation of data produced by this design may well be equivocal.

In view of the economic savings to be realized by the implementation of a dependable screwworm strain testing scheme, I feel that this possibility should be pursued through discussions between you, Dr. O. H. Graham, and Mr. Hopkins. When the two new ARS scientists are on location at Tuxtla Gutierrez this spring, it may then be possible to jointly devise a field testing protocol for routine implementation.

RALPH A. BRAM
National Research Program Leader
Insects Affecting Man & Animals

cc:

D. E. Hopkins

✓ O. H. Graham



United States
Department of
Agriculture

Agricultural
Research
Service

Southern Region

Screwworm Research
P. O. Box 986
Mission, TX 78572

January 19, 1982

Dr. Leo E. LaChance
Metabolism & Radiation Research Lab.
P. O. Box 5674
State University Station
Fargo, North Dakota 58105

By Feb. 8th

Dear Leo,

I have compiled a list of reading materials which should be of value to the ad hoc committee members on the screwworm reproductive isolation question. No doubt there will be some included here that you will not want, and other materials not mentioned that you will want. Nonetheless, here is what I came up with for now. I have only one copy of nearly all of these items at the moment. Duplicating would only be a problem for the Eden-Lincoln report (though perhaps the lengthy Appendix is not necessary). From what I can determine here, APHIS does not have extra copies of the latter report available.

I have arbitrarily divided the reading material into 3 categories - published research papers, technical meeting synopses and unpublished research, and other documents and memoranda. I have not arranged them in any particular order within a category. Please let me know if I can be of further assistance.

Sincerely,

Donald O. McInnis

DONALD O. MCINNIS
Research Geneticist

- ISOzymes w/ Jim
- anything else?

A. Published Research

- M 1. "Effects of Irradiation on the Screw-worm, Callitroga hominivorax (Coq.)" by Kaufman and Wasserman (1957).
- Lee & M 2. "Reproductive system and terminalia of the old world screwworm fly, Chrysomya bezziana Villeneuve" by Spradbury and Sands (1976).
- F 3. "Use of Isozyme Technique to Assess the Quality of Mass-reared Sterile Screwworm Flies" by Whitten (1980).
- Lee - M 4. "Cytotaxonomy of Calliphoridae (Diptera)" by Boyes and Shewell (1975).
- M 5. "Chromosome variation within Drosophila simulans detected by guinacrine staining" by Ellison and Barr (1971).
- M 6. "Quinacrine Fluorescence of Specific Chromosome Regions: Late replication and High A:T Content in Samoaia leonensis" by Ellison and Barr (1972).
- M 7. "Cytogenetics of a Local Population of the Screwworm, Cochliomyia hominivorax, from Northeastern Mexico" by McInnis (1981).
- M 8. "Screwworm Eradication: Inadvertent Selection for Noncompetitive Ecotypes During Mass Rearing" by Bush, Neck, and Kitto (1976).
- M 9. "Screw-worms" by Baumhover, Husman, and Graham (1966).
- M 10. "Mating Behavior of the Screw-worm Fly as Affected by Differences in Strain and Size" by Alley and Hightower (1966).
- Lee & M 11. "Field tests of Sterile Screwworm Flies, Cochliomyia hominivorax (Diptera: Calliphoridae), against natural populations in three coastal areas of Mexico" by Krafur and Hightower (1979).
- M 12. "Ecological Genetics of the Screwworm Fly, Cochliomyia hominivorax (Diptera: Calliphoridae) and Its Bearing on the Quality Control of Mass-reared Insects" by Bush and Neck (1976).
- ? ? 13. "The Screwworm Problem - Evolution of Resistance to Biological Control", R. H. Richardson, editor (1978).

B. Technical Meeting Synopses and Unpublished Research

- W 1. Quarterly Reports of the Screwworm Research Laboratory
- a) Report of April, May, and June, 1979.
 - b) Report of July, August, and September, 1979.
- (Only select portions of these reports are relevant)

W 2. Technical Conference Meetings

- a) February 21, 1979
- b) May 22, 1979
- c) July 31, 1979
- d) December 12, 1979
- e) May 8, 1980
- f) July 16, 1981

(Perhaps only the sections of these reports dealing with research are relevant. The remaining tech. meetings had little, if anything, to report on our subject)

W 3. University of Texas Annual Reports

- a) 1979
- b) 1980
- c) 1981 (this includes a research proposal for 1982)

W 4. ARS report on the Arriaga Genetics study by McInnis, Whitten, Spencer, Mackley, and Peterson (1981).

W 5. "Genetics Studies of Screwworm Populations in Chiapas, Mexico (April-August, 1981)" by McInnis, Whitten, Spencer, Mackley, and Peterson (Journal Article in preparation, 1982).

F 6. "Autocidal Control of Screwworms in North America" by Richardson, Ellison, and Averhoff (in press, 1982; earlier versions are also available)

F 7. "The Genetics of Unmated Male Screwworms, Cochliomyia hominivorax (Cocq.) by Gagné (in preparation, 1982)

C. Other Documents and Memoranda

- F** 1. The Eden-Lincoln Report on the Screwworm Program (Sept., 1974)
- F** 2. Report of the Insect Genetics Workshop, ARS/SEA in Fargo, ND, Oct. 24-26, 1978.
- F** 3. Interim Report on Coop Agreement at Fargo, ND, Dec., 1981
- M** 4. "Interpretations following a study of the external anatomy of the primary screwworm" by Gagné (Sept., 1979). (Letter to D. Lindquist)
- M** 5. Recommendations by the Screwworm Study Group of Drs. Bushland, Knipling, and Lindquist (Feb., 1979)
- M** 6. "Screwworm Research at the University of Texas at Austin" by Klassen and Knipling (May, 1979). (Letter to Meadows and Kinney)
- M** 7. "Talk by R. H. Richardson at the Genetics Soc. of America meeting" by McInnis (Sept., 1980)
- M** 8. "The Interaction of the Environment with Heredity in the Eradication of the Screwworm Fly and the Relationship of Field Observations to the Strain versus Species Question" by Beal (March, 1981)
- hwp** - **M** 9. "Protocol for the Development of New Screwworm Strains" by McInnis (Sept., 1981)
- M** 10. Letter from Knipling to Richardson concerning aspects of the book, The Screwworm Problem (June, 1978).
- M** 11. "Proposal for the Field Test at Arriaga" (Screwworm laboratory memorandum, Nov. 1980).
- F** 12. "Status of Insect Genetics Research in ARS" by LaChance (Dec., 1977).
- F** 13. "Genetic considerations in the establishment of Screwworm factory strains" by LaChance, Seawright, McInnis, and Lindquist (July, 1980).
- M** 14. Letter to H. Graham from R. H. Richardson concerning the findings of the University of Texas researchers after the Arriaga test (Sept., 1981).
- F** 15. "Screwworm Research and Eradication" by Bushland (Dec. 1974). ESA Annual Meeting lecture.
- F** 16. "Eradication and Suppression of the Screwworm Fly by the Sterile male Technique" by Bushland (1978). National Academy of Sciences document.
- M** 17. "Annotated Bibliography of the Screwworm, Cochliomyia hominivorax (Coquerel)" by Snow, Siebenaler, and Newell (Jan. 1981)



United States
Department of
Agriculture

Science and
Education
Administration

Agricultural Research
North Central Region
Metabolism and
Radiation Research
Laboratory

RECEIVED JAN 28 1982
P.O. Box 5674
State University Station
Fargo, North Dakota
58105

January 25, 1982

SUBJECT: Technical Committee for the Study of Potential Reproductive
Isolation in Screwworm Populations

TO: Ralph Bram, National Research Program Leader, LVS
National Program Staff, ARS/USDA
Beltsville, MD 20705

Thank you for your letter of January 8th. I will be happy to organize this committee and to serve as its chairman. I have been in touch with a number of ARS scientists and have obtained a list of approximately 30 geneticists who could be invited to serve on this technical committee. I have prepared a draft letter which was telecopied to you on January 20. Dr. Hugh Graham has approved this letter. After we have had a chance to discuss this, I will begin sending these letters out.

In order for the committee to work rapidly and efficiently, we will have to furnish them extensive briefing materials so that they can obtain adequate briefing from a historical as well as a current perspective. Dr. McInnis and I have discussed this on several occasions. I am forwarding a list that Dr. McInnis has assembled. I will want to discuss it with you before proceeding. Don and I agree that we should furnish all published research and related materials from technical meetings and conferences as well as from annual reports; however, I am not as certain about circulating various letters. Don and I both feel that the letters are important since they give additional information on how certain questions arose and how the thoughts of various scientists have evolved over the past several years.

I plan to have the technical committee assembled by February 8th and begin mailing these documents during that week.

LEO E. LaCHANCE
Technical Advisor for Insect Genetics

Enclosure

cc: H. H. Graham
D. McInnis



United States
Department of
Agriculture

Agricultural
Research
Service

Southern Region
Oklahoma-Texas Area

Screwworm Research
P. O. Box 986
Mission, TX 78572

Dr. Graham - for your info.

January 25, 1982

FOREIGN TRAVEL REPORT

1. Traveler. O. H. Graham, Location/Project Leader, Screwworm Research, Mission, Texas, NRP 20480.
2. Countries Visited. Mexico, Jan. 19-22, 1982.
3. Purpose of Trip. To participate in a Research-Methods Development conference (Jan. 20), to attend a Technical Meeting (Jan. 21) and to represent ARS at the 29th Meeting of the Commissioners, Mexico-American Commission for Screwworm Eradication, Mexico City, Jan. 22.
4. Summary. About 8 people from ARS and Methods Development discussed 9 items of mutual interest in the meeting held on Jan. 20. In addition, Drs. Licon, Reichard, Novy, Pagaza, Judy and Anderson sat in as their time permitted. Most of the day was spent discussing the first 3 items on the agenda: SWASS and its failure in southern Veracruz (and what might be done to improve Swormlure), strain development and strain change, and the genetics of the V-81 strain (which is now undesirably small). All agreed that we in ARS must give the attractant research more impetus. Preliminary results obtained by Drs. Mackley and Brown are encouraging--a modification of the swormlure formula may be much more attractive than swormlure-2 in the humid tropics. However, in swampy regions such as Tabasco the Commission may need to plan a program which does not include the use of SWASS.

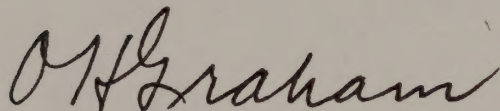
The size of the V-81 strain can probably be increased, it was agreed, by providing better larval care and nutrition on the rearing floor and by deliberately selecting for larger size, but cautiously so as to minimize the chances of amplifying an undesirable trait.

The Technical Meeting on Jan. 21 followed the customary agenda (copy enclosed) with Methods Development & Research as the third item. Dr. Chris Hofmann presented a summary of the previous day's meeting, I discussed the present status of the new strain (Arriaga), Dr. Spencer reported on the SWASS evaluation, and Dr. Jim Whitten discussed the size of the V-81 strain. Biologists René Garcia and Raquel Courtois presented interesting reports on the population dynamics of two wild flies populations and on the rearing of the V-81 strain in the Methods suites at Tuxtla.

At the Joint Commission meeting on Jan. 22 the only item on the agenda was the labor situation at the production plant in Tuxtla Gutierrez. Labor union officials claim that working conditions in the plant are unhealthful and hazardous and that they are, therefore, entitled to work only 30 hours per week and to receive other benefits provided by Mexican law. After a study made last year Mexican public health officials ruled that the union's claims were unfounded, but at the union's insistence

a new study is being made by the Mexican EPA. If I understand correctly, the U.S. Commissioners have taken the position that if the cost of labor increases as a result of rulings made by Mexican agencies the United States will not pay a share of those costs, but will expect Mexico to pay 100%. At this time we do not know whether or not the union will call a general strike. If they do, and if the strike is prolonged, it will have considerable impact on our ARS program and we will have to restructure our Mission-Tuxtla screwworm research.

Also, on Jan. 22 I attended a meeting of the Southwest Animal Health Research Foundation. At that time Dr. Frank Mulhern of the Inter-American Institute for Cooperation on Agriculture presented his organization's plan for continuing screwworm eradication through Central America with the goal of establishing a permanent barrier in Panama about 1988. His presentation was received very favorably and he was asked to discuss his proposal in detail at a general meeting of the Foundation in Dallas in March.



O. H. GRAHAM
Location/Project Leader

Enclosure

cc: R. A. Bram, SS, Beltsville
Norvan Meyer, ADA, Washington, D. C.
H. E. Brown, RL, Weslaco
R. Reichard, Act. Co-Dir., Mexico City
H. C. Hofmann, Ent. Adv., Mexico City
F. E. Smith, C, SV, Hyattsville
R. C. Bushland, Ret., McAllen



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Southern Region
Oklahoma-Texas Area

Screwworm Research
P. O. Box 986
Mission, TX 78572

Dr. Graham - for your info.

January 27, 1982

SUBJECT: Quality Control Analyses of SWASS and Swormlure-2

TO: J. R. Johnston, AD
USDA, ARS, SR
Oklahoma-Texas Area
P. O. Box EC
College Station, Texas 77840

Dr. Brown's memo of Jan. 25 on this subject was prepared after we had jointly assessed our priorities and concluded that he and Mr. Thompson would not be able to do research on the enhancement of Swormlure as long as the Commission's Quality Control operation was located in his laboratory in Weslaco. We had hoped that the Quality Control group would move to Moore Field about Nov. 1, but because of delays in the procurement of equipment and supplies they have continued to work at Weslaco for an additional 3 months.

At the Technical Meeting in Mexico City last week, Dr. Spencer reported the results of the recently completed field test in Veracruz which can be summarized by saying that under the conditions of the test SWASS was completely ineffective and that we cannot reasonably expect the present formulation of SWASS to reduce screwworm populations in southern Veracruz or in other climatically similar regions. However, a few preliminary observations by Drs. Mackley and Brown suggest that they may be able to modify and improve the attractant. Now that Dr. Mackley has returned from home leave it is urgent that Brown and Thompson be able to carry out their part of the joint swormlure enhancement project.

O. H. Graham

O. H. GRAHAM
Location/Project Leader

Enclosure: Brown's memo - Jan. 25

cc: H. E. Brown, RL, Weslaco
C. M. Heald, RL, Weslaco
R. A. Bram, SS, Beltsville
H. C. Hofmann, Ent. Adv., Mexico City
Research Entomologists, ARS, Tuxtla Gutierrez



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Agricultural Research
Southern Region
Oklahoma-Texas Area

AGRICULTURAL PRODUCTS
TECHNOLOGY RESEARCH
P. O. Box 267
Weslaco, TX 78596

January 25, 1982

SUBJECT: Quality Control Analyses of SWASS and
Swormlure-2

TO: Robert Reichard
James E. Novy
O. H. Graham ✓
L. T. Leffler
H. C. Hofmann
Betty Liebe

Due to status and needs of the screwworm program, the time has come that SWASS and Swormlure-2 quality control analysis should be moved from Weslaco to Moore Field, Mission, Texas.

I have been, with the able assistance of Paul E. Thompson, Jr., responsible for the quality control aspects of SWASS and Swormlure-2 for sometime now. On July 16, 1981, through the cooperation of the Screwworm Commission, we hired a chemist to aid with these analyses, on August 5, 1981, we hired an additional chemist as SWASS production had been increased. This second chemist was to take the lead in this program. Again, with increase in SWASS production we hired the third chemist on October 24, 1981. This was with the objective of training these people, with the establishment of a laboratory, and returning the quality control to Mission where it could be more effective.

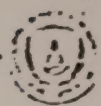
During the later part of October 1981, and prior to the increase of SWASS production to 84,000 lbs. per week, I agreed with Dr. M. E. Meadows, to keep quality control in Weslaco until after the strain change had been accomplished. The new strain has been put in production at Tuxtla Gutierrez and, according to my most current report, has approached 300 million per week. Therefore, we have accommodated the request of Dr. Meadows.

The chemists hired for quality control have been trained, equipment and supplies have been ordered, the laboratory has been established, and with the need to turn my and Paul Thompson's efforts to research, we propose to move these operations to Moore Field, Mission, Texas, immediately.

In the future, all official communications and actions concerning SWASS and Swormlure-2 should be addressed and directed through Dr. O. H. Graham, Screwworm Location Project Leader, at Mission, Texas. However, my phone will be open to any inquiries concerning everyday problems with these materials.

HAROLD E. BROWN
Research Leader

cc: C. M. Heald, J. R. Johnston and Ralph Bram



United States
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Agricultural Research
Southern Region

Agricultural Research Service
Tobacco Research Laboratory
Route 2, Box 16 G
Oxford, NC 27565

February 1, 1982

Dr. R. H. Richardson
Professor of Zoology
University of Texas at Austin
Austin, Texas 78712

Dear Dr. Richardson:

Congratulations on the excellent article "Autocidal Control of Screwworms in North America", SCIENCE 215: 361-70! To my knowledge this is the best in-depth study of the genetics of various strains of the screwworm past and present. Your efforts to analyze past and possible future problems in eradication and suppression programs using the autocidal technique are certainly of high priority. I shudder to think what a serious breakdown in the present program would mean--reinfestation of Southwestern and Southeastern United States and T-bone steaks at \$10/lb.

Since I had been immediately responsible for most of the screwworm research from 1951 to 1965 and served as a consultant and "trouble shooter" through 1977, I feel qualified to comment on various items in your article:

1. "Forewarnings of Genetic Diversity....." p. 363:

On Sanibel Island, egg mass collections during the first 6 weeks of release at the 200/mile²/wk [in the early reports release rates listed included only males, but to avoid confusion I am using the total of both sexes] averaged only 7.1/pen/wk whereas on Curacao during the first 6 weeks at the 200 rate egg masses averaged 21.1. In addition, males only, treated with 2500 r, were released on Sanibel but on Curaç^o both sexes receiving 5000 r were released. Theoretically, releasing males only would have little effect on efficiency of males. In a

Curacao field test screwworms receiving 5000 r were no more effective than those receiving 7500. Although the strain may have deteriorated during the time elapsing between the Sanibel and Curacao studies, the higher natural population on Curacao, based on egg mass data, is the more likely reason for the need to increase the release rates. It is not certain that ".....the release rate had to be quadrupled." During the first 4 weeks of release showers were frequent averaging 9.7 mm of rainfall at 6 weather stations in the northern half of the Island the first week and diminishing to 0.45 the 4th week. Although no flies were released during the 7th through 10th week [because of rearing difficulties] a natural decline occurred following 5 weeks of drouth. Egg masses averaged only 11.4 during the 8th through 10th weeks compared with 21.1 the first 6 weeks. However, time was running out because of a shortage of funds and we elected to go "all out" with the 800 rate and fine tune the technique later if eradication was achieved.

The Florida problem you referred to occurred primarily ⁱⁿ Broward County just north of Miami. This last stronghold of the screwworm persisted primarily because of the tremendous production of screwworms in hundreds of new born calves. The owner had just inherited another ranch and he attempted to operate both ranches without increasing his help. As a result, he was 3 weeks late in treating most of the wounds allowing many of the screwworm larvae to complete development. As Dr. E. F. Knipling frequently has pointed out, the sterile male technique is ineffective against high populations. The Florida problem was also exacerbated by failure to protect the larvae and prepupae from desiccation prior to pupation (Baumhover, 1963).

The problem in Arkansas during 1971 can be attributed at least in part to allowing the infestation to become well established. The livestock owner had not

seen screwworms since 1962 and could not believe they were actually on his property. Six weeks after the first infestation he finally sent in a sample of larvae identified as screwworms. If he had sent a sample from the first infestation the standard "hotspotting" procedures likely would have eliminated the infestation as it had done in hundreds of isolated areas previously. A further problem very likely was a wildlife refuge near the infested area where treatment of animals with insecticides was not possible. Since the Arkansas infestation was firmly established, it would be expected that eradication would not be achieved until the 4th generation regardless of the number or quality of flies released. This essentially occurred after 15 weeks of releases (October 2, 1971), 5 generations at the most. Freezing weather may have helped, but unless adverse sterility data were available, I don't believe we can rule out the effects of the sterile flies. If freezing temperatures were responsible for elimination of the screwworm, why were releases continued at a high level until November 13, 1971?

On Vieques, Puerto Rico, the strain change may have increased effectiveness of the flies but by far the greatest disadvantage occurred due to logistics of transporting the pupae from Mission, Texas to Puerto Rico. Because of the short range and slow speed of the aircraft, pupae were chilled for an extended period and flies were not released until 10 days after irradiation. Early laboratory tests at Orlando, Florida by A. J. Graham showed that chilling the flies for 7 days reduced longevity. Subsequent field tests by APHIS showed that chilling pupae for 7 days or more resulted in severe reductions in recovery of released females in traps. Stress was further indicated by inability of the flies to leave the release cartons promptly.

Eradication from the main Island of Puerto Rico, of course, was also delayed primarily due to extended chilling of pupae which occurred from July 1971 through

August 1973. In September, aircraft used allowed release of flies 2 to 3 days after irradiation and by November 1974 eradication was completed.

Behavior of native screwworms on Puerto Rico was vastly different from those on the U. S. mainland. For months the western and northern portion of the Island remained free of screwworms even though infestations were numerous in the remainder. Dr. Knipling was concerned that Vieques would become infested as long as the main Island (only 9 miles away) was infested, but this did not occur. Whether this lack of movement is genetically controlled or is induced by year round favorable ecological conditions or both is not known. However, this same situation may apply to parts of southern Mexico with similar habitats.

2. Dry Wounds.--In 1962, B. G. Hightower wounded and infested cattle on shoulders and hips with the Florida strain of screwworms. Normally, cattle wounds drained profusely but during this period hot dry winds apparently kept the wounds dry and reduced survival of the small screwworm larvae.

3. Failure of Screwworms to Cause Severe Damage; Non-Treatment of Wounds by Ranchers:--In addition to possible differences in fly strains, certain hosts may have at least partial immunity to the screwworm. When we attempted to re-infest goats in scar tissue resulting from a previous wound the results were almost always negative. Laake and Smith (1939) demonstrated immunity in caviae (Guinea Pig) following the initial infestation.

4. Lack of Odor in Screwworm Infested Wounds:--Some odors are associated with bacteria, particularly *Proteus* spp. (see Eddy et al. 1975). It would be worthwhile to determine which species are in odorous and odorless wounds.

5. Newly Caught Flies Added to Culture (Old Texas Strain):--Although wild screwworms were periodically added to the Texas laboratory strain, it is doubtful that more than a few percent or any contributed to the gene pool. When I attempted to colonize wild flies from Florida and Georgia they would not

oviposit on meat in shell vials held at 95° F. as used routinely for the Texas strain. Consequently, during the first 3 generations egg masses were obtained by exposing infested guinea pigs or goats to the females. Even then they failed to oviposit at 10 days of age, but fair oviposition and hatch occurred at 15 days. In all the strains cultured from the wild that I know of, only one was cultured with little difficulty by A. J. Graham. Very likely this culture originated from escapees from the Mission, Texas screwworm plant. The only way to be reasonably sure that a new strain has been introduced into the colony is to cultivate it at least 6 or 7 generations or until laboratory adapted and make a complete change.

6. Higher Release Rates Against Non-Receptive Strains-Possible "Flushing"

Effects.--Verification that a wild strain is not receptive to the plant strain being released may require use of alternate strains or increased numbers as you suggest. J. Monro (Australia) has published on a "flushing" theory in which released populations might displace the unwanted populations. Barrett (193) followed the northward movement of screwworms from the overwintering areas in Texas with the use of fly traps and naturally infested wounds and found that they were advancing at the rate of 30 mi/week. Hightower et al. (1965) trapped an irradiated female 180 miles from a release point where 20,000 flies were being released weekly. During the 1960's when wild screwworms were breaking through the sterile fly barrier, they usually advanced at the rate of 100 miles per week based on case incidence. The difference between Barrett's results and those during the 1960's may well be due to flushing effect.

In laboratory cages a ratio of 3 males:1 female can shorten the life of females by 50% due to harrassment from males (Baumhover, 1965). The females attempted to hide under paper toweling at the bottom of the cage. Perhaps in nature they would tend to disperse more rapidly when harrassed by males and/or be too busy avoiding rape to oviposit on susceptible hosts.

7. "Population of any endemic types of screwworms on various Caribbean Islands might also have been completely eradicated as a result of autocidal control programs".--Endemic populations of screwworms were eradicated in the early 1970's from Puerto Rico, including Vieques, however, the populations eradicated from St. John, U. S. Virgin Islands, Tortola, British West Indies, and others in that area were recent introductions (Williams et al. 1977).

8. ".....continual mixing without forced crossing....changes in karyotypes.....".--See "5" above. Also, screwworms studied by LaChance were of the Florida strain. A Broward County, Florida, strain had been added to the Florida strain in late 1958, but again this may not have resulted in altering the gene pool. The Florida strain used initially in the southwest program was not subject to the attempted Broward County infusion since an "insurance" colony of this strain had been maintained at Kerrville, Texas previously. Of course, history tells us that the Florida strain originated from Texas or northern Mexico.

9. Possible Introduction of Screwworms from Africa.--The screwworm in Africa is the old world screwworm, Chrysomya bezziana. Although its biology, behavior and damage are very similar to our screwworm, it is a different species. If it were introduced into North America it would be another "ball game".

10. Mass Culture Facility in the United States to Combat an Outbreak.--I doubt if you can sell U. S. officials on the desirability of having a screwworm rearing facility in the United States because of the risks of escapes. Presumably, the old Mission factory could be renovated and re-activated if it has not been drastically converted for rearing other insects for biological control. As screwworms hopefully are pushed further south into Mexico, it seems to me that the current 500,000,000 weekly fly production could be reduced and

that several additional strains could be produced at the Tuxtla plant in Mexico if needed. It may be necessary to modify procedures to keep the cultures separate, particularly in collecting larvae, but I don't see any problems in air transport of the flies to the United States.

11. Lack of Response of Screwworms in Southern Mexico to the SWASS

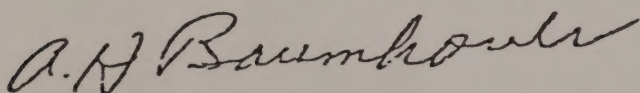
Attractant.--It is interesting but disturbing that southern Mexican flies fail to respond to SWASS. I trust research is being directed to this problem.

12. Deer Populations Causing Crop Damage in South Texas.--All reports I have heard or seen praise the eradication program for the substantial increase in deer, not only in Texas but Florida. Deer leases to hunters not only provide substantial income to ranchers, but also to communities involved.

13. Economics of Eradicating the Screwworm in Central America.--The next logical step, in my opinion, would be to eradicate the screwworm all the way to Panama City, Panama. The Isthmus of Panama for the most part below Panama City is less than 50 miles wide. If screwworms here behave as they did in Puerto Rico, i. e., fail to disperse, this may provide a natural barrier requiring few, if any, flies for release. This certainly would be worthy of study in the near future.

My comments refer to sections noted on the enclosed copy of your article. Various references cited above can be found in the "Annotated bibliography of the screwworm, *Cochliomyia hominivorax* (Coquerel) by Snow et al. 1981. I am enclosing it as well as several reprints and copies of reports.

Sincerely,



A. H. BAUMHOVER
Research Leader
Tobacco Insects

2 de febrero de 1982

PARA: DEPTO. DE INGENIERIA Y
MANTENIMIENTO

POR MEDIO DE: DR. EDUARDO RIOS SALAS

February 2, 1982

TO: ENGINEERING AND MAINTENANCE
DEPARTMENT

THROUGH: MR. W. H. SUDLOW

A continuación citamos algunos puntos que faltan para dejar terminada la barrera del cuarto de 5½ días, misma que nos ayudará en un 100% al control de las moscas caseras.

Los puntos que faltan son:

1. El acceso a la entrada de la pupa debe tener un sello automático positivo, que sea a prueba de moscas y luz, para cuando la pupa no pase a través de él.
2. La entrada para los trabajadores debe consistir de dos cuartos pequeños contiguos, con una puerta que se comunique al cuarto de 5½ días, otra entre los dos cuartos, y otra mas al área general de trabajo. Se debe tomar alguna medida que permita que sea una sola puerta que se abra a la vez.
3. Se debe sellar todas las rendijas por donde se filtre luz, es decir, alrededor de las puertas, entradas de cables, tubos y monorrieles, en el cuarto de 5½ días y el área general de trabajo.

We would like to point out what is needed to complete the barrier of the 5½ day-room to make it 100% effective for control of houseflies.

Three factors that need attention are:

1. The intake chute (for pupae) has to have a positive automatic seal that is fly-and-light proof when pupae are not being actually passed through.
2. The entrance for workers has to consist of two adjoining small rooms with a door into the 5½ day-room, a door between the two rooms, and a door into the general work-area; an arrangement must be used that will permit only one door at a time to be open.
3. All light-leaks between the 5½ day-room and the general-work area must be sealed, that is, the periphery of all doors, and the entrances for wires, pipes and monorails.

Atentamente

Sincerely

Raquel Eco. Courtois

Comisión México-Americana
PARA LA ERRADICACION
DEL GUS NO LARRENADOR

FEB. 16 1982

División de Ingeniería

Chico, Chiriquí

Donald E. Hopkins

(He wanted to know why 3 doors were needed.)

McKey and I talked about the things (factors) that needed completion on Feb. 3, 1982. He had not started work on work orders at that time on the system of doors and we discussed it in detail. He details were given to him. The chute was being fixed.

12-II-82

From these are some reasons
for making the entrance to the
5 1/2-day room as dark as possible;
the reasons are:

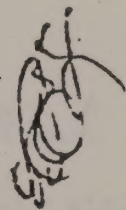
1) When a worker is leaving, if
flies can sense light coming
through the door he opens, some
will leave with him. If, on the
other hand, he must enter a
small dark room, close the door
and be in darkness, then pro-
gress into another dark room,
and close the door behind him be-
fore he exits into the general
work area, then the chances of
flies accompanying him are less.

2) When a worker is en-
tering, if flies can sense
light coming through the door-
way directly into the 5 1/2-day
room they will go through that
doorway and continue to pro-
gress to the general work area.

If light should be pro-
vided for the safety or con-
venience of workers then small
infrared sources should be
provided.

Sincerely,
D.C. Hoffman

11-III-82



I would like to be given the responsibility of completing the isolation of the $5\frac{1}{2}$ -day room, and ^{of doing} ~~the~~ the work myself if necessary.

The uncompleted portions of the barrier for isolation are:

1) The entrance for personnel has not been completed; it should consist of two small adjoining rooms of solid material with a solid door between and doors leading to the general work area and into the $5\frac{1}{2}$ -day room. The interior of the rooms and of the door should be painted black. (As of 10-III-82 the frame for the rooms had been constructed and covered with screen, which should be replaced with plywood, and the door between the small rooms had not been installed.)

2) The intake chute (for pupae) has not been equipped

with an automatic seal
that is light-and-~~fire~~-proof
when not actually in use.

The estimated requirements
are:

For entrance

1. Set of hinges for the
"center" door.
2. Fastener for the door.
3. About 128 sq ft. of
1/4" plywood.
4. About 0.5 kg of nails
about 4 cm. in length.
5. About 2 liters of black
paint.
6. A 7 1/2 - 10 cm paint brush.
7. A carpenter's hammer.
8. A carpenter's cross-
cut saw.
9. About 1 liter of lime
caulking material.
10. About 8 hrs labor.

For pupae-chute

1. Flat piece of light
gauge aluminum
about 12 x 20 cm.
2. a small strap hinge
3. 6 1/4" metal screws

4. Hack saw
5. Hand shears for metal
6. Small screw-driver.
7. Metal file
8. about 2 hrs labor

D.E. Hopkins



United States
Department of
Agriculture

Agricultural
Research
Service

Southern Region
Oklahoma-Texas Area

Screwworm Research
P. O. Box 986
Mission, TX 78572

February 5, 1982

SUBJECT: Check on SWASS Performance in Western Mexico

TO: Dr. Nazario Pineda V., Director
Dr. Robert Reichard, Acting Co-Director
Comision Mexico-Americana Para
La Eradicacion del Gusano Barrenador
Leibnitz No. 20-12⁰ Piso
MEXICO 1, D. F.

At the recent Technical Meeting in Mexico City it was suggested that SWASS may not be as effective in Nayarit, Jalisco and Colima as we had hoped. After discussions with Dr. Hofmann and Mr. Bruce, we propose that ARS and Methods Development run a series of "quickie tests" at 3 locations around Guadalajara in which a "super pellet" (23% swormlure) would be compared with the production formulation (usually 17-19% swormlure). In order that we may start these tests next week Mr. Melquiades Leal and Mr. Bobby Handke will plan to arrive in Guadalajara on Tuesday afternoon, Feb. 9 and will report to Dr. Asin. They propose to follow a protocol prepared by Dr. Harold Brown and me, but may need to make on-the-spot modifications according to what they find.

O. H. GRAHAM
Location/Project Leader

cc: N. L. Meyer, ADA, Washington, D. C.
F. E. Smith, C, SV, Hyattsville
H. C. Hofmann, Ent. Adv., Mexico City
J. R. Johnston, AD, College Station
H. E. Brown, RL, Weslaco

Enclosure: copy of Protocol

PROTOCOL FOR SWASS EVALUATION

in Western Mexico

February, 1982

1. Use kill buckets to measure response of sterile and wild flies to samples of "standard pellet" from storage at a distribution center and "super pellet" carried from Mission.
2. Hang a minimum of 20 pairs of kill buckets in a test area so as to make a direct comparison of the two pellets at each site. Reverse the buckets at each site each day. Check the buckets two times each day, and in the same order each time. Run the test in Area A for 4 days and then move to Area B.
3. Hang a minimum of 10 WOT's in the same general area as the kill buckets, perhaps using the same ranches, but separate WOT's from kill buckets by at least 100 meters. Check WOT's daily. Carry swormlure from a batch at Mission that has been analyzed & approved.
4. When kill buckets and traps are checked, count SW flies and identify by sex and whether they are probably sterile or wild. Save all wild flies and all questionable flies and store in liquid nitrogen.
5. If available, collect larvae from any cases in the area and preserve in liquid nitrogen (this is priority 2; do not invest much time in the effort).
6. Probable test areas (this may change after you arrive in Guadalajara):
 - Area A - vicinity of Ahuacatlañ, probably valley of Rio de Ameca, in southern Nayarit.
 - Area B - area south of Lago de Chapala in more or less the center of sterile fly grid, but where SWASS has not been dispersed. Probably in area Jiquilpan - Jacona - Los Reyes - Cotija. Look for ranches having screwworm cases within this area as places for hanging kill buckets.
 - Area C - anywhere in state of Colima. Contact Nacho Cabrera. Select an area at least 10 miles x 10 miles where they are having the most screwworm cases.
7. Explain what you plan to do to Dr. Asin (or his designated representative if he is away) as soon as you arrive in Guadalajara and ask for his approval and cooperation. Also contact Jim Bruce, Wilford Farnsworth and Biol. Rojas while in Guadalajara. Leave copy of protocol with Dr. Asin and Jim Bruce. Be flexible about test areas - better ones may develop after you arrive in Guadalajara.
8. Collect samples (6-8 pellets) of SWASS for chemical analysis at Weslaco. Take samples of standard pellets from each bag at the time you open the bag. Take samples of SWASS and swormlure at end of test exposure. Place samples in sealed container in ice chest with dry ice for return to Weslaco.

DRIVE CAREFULLY! AVOID NIGHTTIME DRIVING!

TO
Fly Production Employees & Guards

1

February 5, 1982

SUBJECT

RECEIVED FEB 9 1982

Screwworm Security

FROM

Paul R. Nichols
Entomologist, Fly Production

MESSAGE (WRITE CONCISE MESSAGE. SIGN AND FORWARD PARTS 1 AND 3 TO ADDRESSEE. RETAIN PART 2.)

Maintain records of all items sent out of the plant through the hot room and pass box. Items placed in the hot room for removal from the plant will be marked with the proper date and shift. They will remain in the hot room for 48 hours before removal.

No viable Screwworm forms will be removed from the plant without prior approval from Dr. Harold Brown, Paul R. Nichols, Dr. Lloyd Wendel or Dr. Hugh Graham.

SIGNATURE

Paul R. Nichols

REPLY (USE THIS SPACE FOR REPLY. SIGN AND DATE. RETURN PART 3 TO SENDER. RETAIN PART 1)

H. Graham

SIGNATURE

DATE



United States
Department of
Agriculture

Animal and
Plant Health
Inspection Service

RECEIVED FEB 19 1982

Federal Building
Hyattsville, MD 20782

Subject: Cost-Benefit Analysis of the
Screwworm Program

To: See DISTRIBUTION

Date: February 8, 1982

Enclosed is a copy of an updated analysis of the cost of cattle losses from screwworms in the absence of an eradication program. The analysis was prepared by Oklahoma State University for calendar year 1980 at the request of Mr. Ed Ketchum, President of SWAHRF. We are indebted to Mr. Ketchum for providing this information.

Please review the information and address any comments to me. Thank you.

Floyd E. Smith
Chief Staff Veterinarian
Screwworm Eradication Program
Sheep, Goat, Equine, and Ectoparasites
Veterinary Services

Enclosure

DISTRIBUTION:

N. L. Meyer, APHIS-OA, Washington, DC, through M. J. Tillery
V. C. Beal, VS, Hyattsville, MD
R. E. Reichard, Acting Co-Director, Mexico City, Mexico, through N. L. Meyer
Ralph Bram, ARS, Beltsville, MD ✓

2/9
ph
2/11/82

Chester Gibson
FTS 436-8321
Hyattsville

RECEIVED MAR 8 1982

February 10, 1982

Dr. Kenneth Thompson
MSDA, APHIS, US
P.O. Box AD
Santurce, Puerto Rico 00908

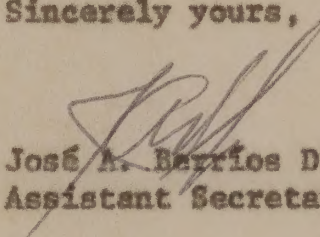
RE: SWASS (SCREWWORM ADULT
SUPPRESSION SYSTEM)

Dear doctor Thompson:

Enclosed please find copy of the letter received from EPA
requesting additional information about the above referenced product.

Please urges that USDA send us the requested information so
as to submitted immediately to EPA.

Sincerely yours,


José A. Barrios Díaz
Assistant Secretary

cc: Mr. James R. Cappedge
U.S. Department of Agriculture

Enclosure

ARG/am



RECEIVED MAR 3 1982
 7-15-82
 8-25-82
 10-15-82

February 10, 1982

Mr. Kenneth Thompson
 EPA, 400 M
 1000 AD
 Washington, D.C. 20460

U.S. DEPT. OF AGRICULTURE
 (OPTIONAL FORM NO. 10)

Dear Mr. Thompson:

Enclosed please find copy of the letter received from EPA
 requesting additional information about the above referenced product.

Please advise what EPA and is the requested information so
 as to submit immediately to EPA.

Sincerely yours,

John A. Johnson
 Assistant Secretary

cc: Mr. James E. Campbell
 U.S. Department of Agriculture





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF TOXIC SUBSTANCES

Berrios
Estado Libre Asociado De Puerto Rico
Departamento De Agricultura
Apartado 10163
Santurce, PR 00908

Attn: Signor Jose A. Berrios Diaz

Gentlemen:

✓ Subject: Registration Action under Section 24(c)
EPA SLN No: PR-810003

This will acknowledge receipt of your notification of May 14, 1981 to this Agency of a registration, pursuant to section 24(c) of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (FIFRA), as follows:

Product: SWASS Pellets

EPA Reg. No: New

24(c) Registrant: USDA

This acknowledgement is not to be construed as an EPA approval of this registration.

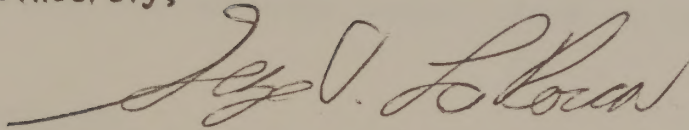
We have the following comments concerning this Special Local Need Registration:

1. Although the application/registration form mentions a Confidential Statement of Formula, one was not included with the submission. ✓
It is necessary to have a Confidential Statement of Formula on file for new SLN registrations. Please have the registrant forward a copy of the Confidential.
2. Since this registration is for a new product and full labeling is required, this labeling should be in compliance with current federal labeling regulations. Therefore, please have the registrant make the following revisions to the labeling and forward a revised copy for our records. Your cooperation in this matter is appreciated.
 - a. A net weight must be given on the label; preferably giving weight and approximate number of tablets (e.g. "Net weight 1 lb./150 tablets approx.") or if you prefer just net weight.
 - b. Immediately following the signal word "DANGER" insert the following headings:

"PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS (& DOMESTIC ANIMALS)"

- c. In the "HAZARDS TO HUMANS..." section delete "technical dichlorvos" and insert "SWASS Pellets" where the other term had appeared. Revise "During commercial operations..." to read: "During prolonged exposure to SWASS Pellets, wear a pesticide respirator jointly approved by the Mining Enforcement and Safety Administration (formerly the U.S. Bureau of Mines) and by the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11."
- d. Delete the heading "DISPOSAL", insert the heading "STORAGE AND DISPOSAL" and use the enclosure to revise the text of this section.
- e. Revise the "FIRST AID" statement as follows:
 - "If swallowed-Call a physician or Poison Control Center immediately. Induce vomiting by giving victim one or two glasses of water and inserting finger in back of throat. Repeat until vomit fluid is clear. Do not induce vomiting or give anything by mouth to an unconscious person.
 - If fumes are inhaled-Remove victim to fresh air. Apply artificial respiration if indicated.
 - If on skin- Wash affected areas with soap and water.
 - If in eyes- Flush eyes with plenty of water. Call a physician immediately.
 - Get medical attention in all cases of suspected poisoning."

Sincerely,



George T. LaRocca
Product Manager (15)
Insecticide-Rodenticide Branch
Registration Division (TS-767C)

STORAGE AND DISPOSAL

(type size
requirements)

Do not contaminate water, food or feed by storage or disposal

STORAGE:

PESTICIDE DISPOSAL:

CONTAINER DISPOSAL:

Pesticide, spray mixture,
or rinse water that cannot be
used according to label
instructions must be disposed
of according to Federal or
approved state procedures
under Subtitle C of the
Resource Conservation and
Recovery Act.

TABLE XIV--CONTAINER DISPOSAL STATEMENTS

Container Type	Disposal statement
Metal containers	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other approved state and local procedures.
Plastic containers	Triple rinse (or equivalent). Then offer for recycling or reconditioning, or dispose of in a sanitary landfill, or by incineration if allowed by state and local authorities.
Glass containers	Triple rinse (or equivalent). Then dispose of in a sanitary landfill, or by other approved state and local procedures.
Fiber drums with liners	Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of liner in a sanitary landfill or by incineration if allowed by State and local authorities. If drum cannot be reused ¹ , dispose of in the same manner.
Paper and plastic bags	Completely empty bag by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application equipment. Then dispose of bags in a sanitary landfill or by incineration if allowed by State and local authorities.
Compressed gas cylinders	Return empty cylinder for reuse (or similar wording).

¹Manufacturer may replace this phrase with one indicating whether and how fiber drum may be reused.

Disposal statement

Page 1

Triple check for accuracy. This check for accuracy is required for all disposal statements. It is a necessary condition for all disposal statements and local authorities.

Double check

Triple check for accuracy. This check for accuracy is required for all disposal statements. It is a necessary condition for all disposal statements and local authorities.

Double check

Triple check for accuracy. This check for accuracy is required for all disposal statements. It is a necessary condition for all disposal statements and local authorities.

Double check

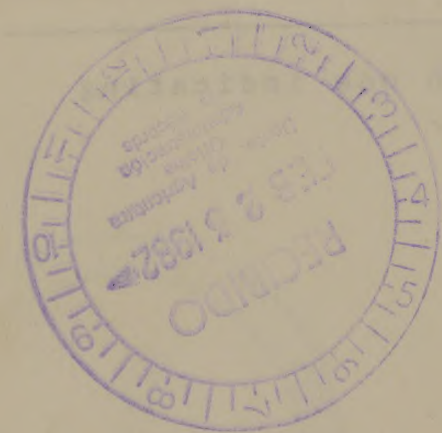
Completely empty. This is a necessary condition for all disposal statements. It is a necessary condition for all disposal statements and local authorities.

Double check

Completely empty. This is a necessary condition for all disposal statements. It is a necessary condition for all disposal statements and local authorities.

Double check

Completely empty. This is a necessary condition for all disposal statements. It is a necessary condition for all disposal statements and local authorities.



ESTADO LIBRE ASOCIADO DE PUERTO RICO
DEPARTAMENTO DE AGRICULTURA
SANTURCE, PUERTO RICO 00908



JAMES R. COPPEDGE
UNITED STATE DEPT. OF AGRICULTURE
SEA AR
P.O. BOX 986
MISSION, TEXAS 78572

"AL SERVICIO DEL AGRICULTOR PARA LA REHABILITACION DE LA AGRICULTURA DE PUERTO RICO"

REFERENCE SLIP

2-11-83

TO

Graham

☐

ACTION

☐

NOTE AND RETURN

☐

APPROVAL

☐

PER PHONE CALL

☐

AS REQUESTED

☐

RECOMMENDATION

☒

FOR COMMENT

☐

REPLY FOR SIGNATURE OF

☐

FOR INFORMATION

☐

RETURNED

☐

INITIALS

☐

SEE ME

☐

NOTE AND FILE

☐

YOUR SIGNATURE

REMARKS

FROM

Ralph A. Bram

Handwritten signature

- | | |
|---|---|
| ☐ ACTION | ☐ NOTE AND RETURN |
| ☐ APPROVAL | ☐ PER PHONE CALL |
| ☐ AS REQUESTED | ☐ RECOMMENDATION |
| ☒ FOR COMMENT | ☐ REPLY FOR SIGNATURE OF |
| ☐ FOR INFORMATION | ☐ RETURNED |
| ☐ INITIALS | ☐ SEE ME |
| ☐ NOTE AND FILE | ☐ YOUR SIGNATURE |

Ralph A. Bram

Research Priorities for Major APHIS Programs

Staham

ARS Staff

APHIS Staff

Date: 2/9/82

Name: R. A. Bram

Name: F. E. Smith

APHIS Program: Screwworm Eradication

Position: NRPL

Position: Chief Staff Veterinarian

Current ARS Research Activities		APHIS Research Needs in Priority Order			
	SY	FY 82	FY 83	FY 84*	Long-Range Goals
1. Strain development	1	1. Strain development	1. Strain development	1. Strain development	1. Strain developmen
2. SWASS-swormlure enhancement	2	2. SWASS enhancement	2. SWASS enhancement	2. Genetics (population characterization and all male strain)*	2. Ecology in Centra America*
3. Genetics (population characterization and sexing)	3	3. Genetics (population characterization)	3. Genetics (population characterization)	3. Ecology in Central America*	3. Ecology in South America*
4. Other attractants	2	4. Ecology in Southern Mexico	4. Ecology in Central America	4. SWASS enhancement	4. Genetics (populat characterization all male strain)
5. Field biology and ecology	2	5. Diet improvement	5. Other attractants	5. Other attractants	5. Other attractants
		6. Other attractants	6. All male strain	6. Diet improvement	6. Systemic insecti-cides
		7. All male strain	7. Diet improvement	7. Systemic insecti-cides	7. Diet improvement
		8. Systemic insecti-cides	8. Systemic insecti-cides		

DRAFT

*Items identified with an asterisk will require budget increases, redirection of resources, or other program adjustment for initiation in FY 84.

Research Priorities for Major APHIS Programs

SCREWORM ERADICATION

FY 82

The highest priority for APHIS in FY 82 and subsequent years is screwworm development. Although no longer a purely research function, it is, nevertheless, of paramount importance to the success of the program and should continue as a cooperative activity between APHIS program personnel and ARS scientists. The second order of priority will remain to be SWASS-swormlure enhancement in humid tropical areas. Genetic population characterization assumes the third order of priority - specific direction of this research will be reassessed following completion of the technical panel study of the possibility of reproductive isolation between screwworm populations. Screwworm ecology in Southern Mexico must continue in advance of the eradication program. Fifth in priority is the improvement of screwworm diet. Other priorities of somewhat equal importance are the development of alternative attractants (both feeding and oviposition attractants), development of an "all male" strain, and the development of systemic insecticides for regulatory use.

FY 83

The first three priorities of FY 82 (strain development, SWASS enhancement, and genetics) remain unchanged for FY 83. Ecological research should begin to advance into Central America. The importance of developing alternative attractants should advance to fifth priority. Research should continue on development of an "all male" strain, diet improvement, and systemic insecticides for regulatory use.

FY 84

Strain development continues as the first priority. Assuming that the question of SWASS effectiveness in the humid tropics has by now been resolved, research on insect genetics (including development of an "all male" strain must now assume greater prominence with a budget increase of \$250,000 divided between the Fargo and Tuxtla Gutierrez locations. By now, a major effort, which will require a budget increase of \$250,000 by the Tuxtla Gutierrez location, will be required to intensively study screwworm ecology in Central America. A significant research effort must be maintained for SWASS enhancement, alternative attractants, diet improvement, and systemic insecticides for regulatory use.

Long-Range Goals

With the long-term objective of extending screwworm eradication through Central America in mind, ecological and biological research, as well as genetic characterization of screwworm populations, are of high priority importance. The development of an "all male" strain must continue to receive research priority because of its potential of reducing the cost of maintaining a barrier zone. Continuing efforts will be necessary to improve diet, develop alternative attractants, and develop systemic insecticides for regulatory use.

DRAFT

AD meeting Folder -

EX WORTH 3/24-25/82

APHIS



United States
Department of
Agriculture

Agricultural
Research
Service

Office of the
Administrator

RECEIVED FEB 26 1982
Washington, D.C.
20250

Copy: ROD, HG, CMH, HD, DB, DAW, KJS

February 12, 1982

Copy for Area Director

Collected Internally

SUBJECT: Support of APHIS

TO: Regional Administrators

As you know, we have given high priority to research support of programs of the Animal and Plant Health Inspection Service (APHIS). At headquarters we have met regularly with our counterparts in APHIS to determine what their needs are and how we in ARS can, within resources available, meet those needs. We have enjoyed good cooperative relationships and only rarely has there been a misunderstanding or expression of concern from either side. It is important for this relationship to exist throughout our organization. Please remind those employees at the field or bench level that one of our obligations is to fulfill the research needs of APHIS insofar as possible.

I fully recognize that our scientists cannot make commitments for resources or program changes. Thus, it is important that they have a level of rapport with their APHIS peers that will permit them to respond in a credible manner. If an APHIS employee identifies a need at the bench level that requires response beyond the purview of the ARS employee, the concern or need should be referred up the line as far as necessary in order to be resolved quickly.

By a copy of this memorandum to Dr. Mussman, Administrator, APHIS, I am asking him to similarly communicate with APHIS employees at field locations.

This memorandum is in no way intended to be a criticism of any ARS employee. We can be proud of the cooperative and responsive attitude of our employees. The purpose is to remind our employees of the importance of interaction with our APHIS colleagues at all levels and to provide guidance on how to best respond in circumstances where authorities are unclear.

T. B. Kinney

T. B. KINNEY, JR.
Administrator

cc:

H. C. Mussman
T. J. Army
NPS Chiefs
M. E. Carter
H. J. Brooks
A. R. Bertrand

cc:
Area
Director

2-19
Lal

RECEIVED FEB 22 1982

February 17, 1982

MEXICO WEEKLY SCREWORM STATUS REPORT
January 31 - February 6, 1981

1. No ground releases were made this week.
2. Production data for the V-81 strain is as follows:

Pupae irradiated: 288,197,508
Pupae yield/vat: 10.69 liters; a decrease of 4.02 liters
Larvae size: 57.56 mg.; a decrease of 2.96 mg.
Grams of eggs/cage: 95.43 grams; an increase of 2.96 grams

The following table compares grams of eggs of the V-81 and Sinaloa strain during the same period of development. The table also reflects the grams of eggs Sinaloa was producing just prior to the introduction of V-81.

V-81		Sinaloa	
<u>Week Ending</u>	<u>Grams of Eggs</u>	<u>Week Ending</u>	<u>Grams of Eggs</u>
12/12/81	60.7	12/13/80	80.62
12/19	68.27	12/20	46.3
12/26	61.01	12/27	54.4
1/2	81.49	1/3	59.77
1/9	92.41	1/10	71.24
1/16	112.75	1/17	57.65
1/23	112.75	1/24	79.10
1/30	92.47	1/31	69.98
Avg.	85.23	Avg.	64.9

Sinaloa prior to V-81

11/7/81	117.6
11/14	110.2
11/21	109.1
11/28	109.2
12/5	98.01

Avg. 108.8

3. Flies Released - Durango

Durango	34,291,136
Jalisco	767,360
Nayarit	2,622,048
Zacatecas	4,981,856

42,662,400

Flies Released - Mazatlan

Chihuahua	304,560
Durango	12,581,680
Nayarit	16,131,456
Sinaloa	27,583,904

56,601,600

Flies Released - Tampico

Guanajuato	9,715,200
Hidalgo	17,318,400
Queretaro	11,827,200
San Luis Potosi	47,308,800
Tamaulipas	39,705,600
Veracruz	26,188,800

152,064,000

0178
Don
ARR
RBB
Rm

Flies Released - Uruapan

Colima	2,766,400
Guerrero	2,297,100
Jalisco	10,494,800
Michoacan	16,608,000

32,166,300

Fly release information from Tepic is pending this week. It is also pending from Tepic for the weeks ending October 10, December 12, December 19, December 26, January 2, January 9, January 16, January 23, and January 30.

4. The following is a table of screwworm and nonscrewworm samples identified during the week. The table also lists the numbers of sterile flies released and the number of inspectors in each State. (The number of inspectors reported does not include Commission auxiliary supervisors, nor Federal Mexico or U.S. Supervisors).

	No. Inspectors	Screwworm	Nonscrewworm	Sterile Flies Released 1/31/82 - 2/6/82 (millions)
Chihuahua	9	0	0	1
Nuevo Leon	9	0	3	0
Tamaulipas	17	0	0	40
Colima	3	10	0	3
Durango	24	2	0	47
Guanajuato	8	9	1	10
Guerrero	17	21	0	3
Hidalgo	7	11	2	18
Jalisco	29	18	0	12
Michoacan	25	27	2	17
Nayarit	30	7	1	19
Puebla	17	6	0	0
Queretaro	2	0	0	12
San Luis Potosi	21	8	9	48
Sinaloa	16	0	1	28
Veracruz	26	6	0	27
Zacatecas	13	1	2	5

5. SWASS produced at Mission this week: 63,540 pounds (28,822 kilograms).

SWASS Releases - Manzanillo

Colima	1,715 kilograms
Jalisco	5,961 kilograms
Michoacan	1,387 kilograms

SWASS Releases - Mazatlan

Durango	1,591 kilograms
Nayarit	476 kilograms
Sinaloa	8 kilograms

SWASS Releases - Tampico

Guanajuato	1,465 kilograms
Hidalgo	680 kilograms
Puebla	23 kilograms
Queretaro	726 kilograms
San Luis Potosi	2,576 kilograms
Tamaulipas	1,279 kilograms
Veracruz	1,320 kilograms

SWASS release information is pending this week from Uruapan and Tepic.

6. Pertinent information: No new screwworm cases have been reported north of the critical line (Mazatlan to Tampico) in Mexico.

Screwworm Cases Identified Week Ending January 30





United States
Department of
Agriculture

Agricultural
Research
Service

Southern Region
Oklahoma-Texas Area

Screwworm Research
P. O. Box 986
Mission, TX 78572

Dr. Graham for your info.

February 18, 1982

Dr. Gordon K. Klintworth
Professor of Pathology
and Ophthalmology
Duke University Medical Center
Department of Pathology
Box 3712
Durham, North Carolina 27710

Dear Dr. Klintworth:

Under separate cover I am mailing you a tube which contains first instar larvae of Cochliomyia hominivorax preserved in 70% ethyl alcohol. These larvae were collected from laboratory rearing medium a few hours after they hatched. We are happy to send these to you without cost and hope they will be useful to you. Dr. Dennis Ring is the scientist who reared these larvae.

Sincerely,

O. H. GRAHAM
Location/Project Leader

cc: R. O. Drummond, RL, Kerrville
D. R. Ring, Res. Ent., Mission



February 18, 1981

FOREIGN TRAVEL REPORT

1. Traveler. O. H. Graham, Location/Project Leader, Screwworm Research, Mission, Texas, NRP 20480.
2. Countries Visited. Mexico, Feb. 11-12, 1982.
3. Purpose of Trip. To observe an informal meeting of the Commissioners, Mexico-American Commission for Screwworm Eradication, in Tijuana, B.C.N.; to attend a ceremony in which the states of Baja California Sur, Baja California Norte, and Sonora were officially declared free of screwworms; and to participate in a Technical Meeting.
4. Summary. In a brief informal meeting on the afternoon of Feb. 11 the Commissioners reviewed the status of their negotiations with the labor union in Tuxtla Gutierrez. Dr. Pineda explained that the plant had been found not to be either unhealthful or hazardous as claimed by the union spokesmen, but because of unpleasant working conditions certain concessions were being offered to the workers. An agreement had been prepared for signature by both groups on Feb. 11 (Later it was announced that the agreement would be signed the following week).

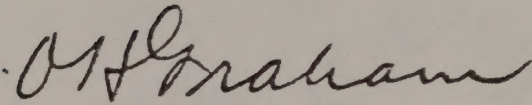
While the new labor agreement will add about U.S. \$1.2 million to the annual cost of sterile fly production, Dr. Pineda was optimistic that the quantity and quality of the flies will improve and that production goals (currently 500 million/week) will be achieved. The threat of a strike at Tuxtla seems to have greatly diminished.

The Commissioners were handed a letter from Dr. Frank Mulhern which described a proposal for eradicating screwworms from Central America. The Commission's approval and support is being solicited by the Inter-American Institute for Cooperation on Agriculture.

In addition, the Institute plans to present the proposal to CIAGA, an interamerican livestock producer organization (one of the Mexican commissioners, Mr. de la Garza, is currently president of CIAGA). The Commission decided to consider the proposal in more detail at their next meeting in April.

U.S. Secretary of Agriculture, John Block, Mexican Secretary, Francisco Merino-Robago and the governors of 3 Mexican states presided at a ceremony in which eradication of the screwworm from a large area of north-western Mexico was officially declared to have been achieved. The elaborate ceremony was attended by several hundred livestock producers and was quite impressive. It was an emotional moment for the animal health officials of both countries who labored under severe handicap for about 3 years to deliver adequate numbers of sterile flies to the remote Baja California peninsula.

While the Technical Meeting on Feb. 12 followed the customary format, attention was focused on SWASS and problems in its production and distribution. At least in some areas persistent screwworm infestations have not been eliminated in spite of coverage with SWASS for 2 to 4 months. The problem may have been complicated by some deficiencies in program execution, but it was recognized that quality of the product at the time of dispersion has varied (but perhaps not significantly). It was generally agreed that supervision and coordination of the entire SWASS operation should be improved and that some type of field bioassay is needed. If larger numbers of sterile flies can be produced, the Directors will probably opt to reduce the use of SWASS.



O. H. GRAHAM

Location/Project Leader

cc: R. A. Bram, SS, Beltsville
N. L. Meyer, ADA, Washington, D. C.
F. E. Smith, CSV, Hyattsville
R. Reichard, Act. Co-Dir., Mexico City
H. C. Hofmann, Ent. Adv., Mexico City
W. H. Sudlow, Dir. Plant Oper., Tuxtla Gutierrez
H. E. Brown, RL, Weslaco
R. C. Bushland, Ret., McAllen

REFERENCE SLIP

2/19

TO

① McInnis ✓
② Ring ✓
③ Mangan & Brenner

☐ ACTION☐ NOTE AND RETURN☐ APPROVAL☐ PER PHONE CALL☐ AS REQUESTED☐ RECOMMENDATION☐ FOR COMMENT☐ REPLY FOR SIGNATURE OF☐ FOR INFORMATION☐ RETURNED☐ INITIALS☐ SEE ME☐ NOTE AND FILE☐ YOUR SIGNATURE

REMARKS

FROM



United States
Department of
Agriculture

Animal and
Plant Health
Inspection Service

RECEIVED FEB 19 1982

Federal Building
Hyattsville, MD 20782

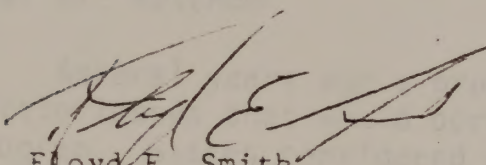
Subject: Cost-Benefit Analysis of the
Screwworm Program

To: See DISTRIBUTION

Date: February 8, 1982

Enclosed is a copy of an updated analysis of the cost of cattle losses from screwworms in the absence of an eradication program. The analysis was prepared by Oklahoma State University for calendar year 1980 at the request of Mr. Ed Ketchum, President of SWAHRF. We are indebted to Mr. Ketchum for providing this information.

Please review the information and address any comments to me. Thank you.


Floyd E. Smith
Chief Staff Veterinarian
Screwworm Eradication Program
Sheep, Goat, Equine, and Ectoparasites
Veterinary Services

Enclosure

DISTRIBUTION:

N. L. Meyer, APHIS-OA, Washington, DC, through M. J. Tillery
V. C. Beal, VS, Hyattsville, MD
R. E. Reichard, Acting Co-Director, Mexico City, Mexico, through N. L. Meyer
Ralph Bram, ARS, Beltsville, MD ✓

2/9
ph
2/11/82

Texas A&M University

DEPARTMENT OF AGRICULTURAL ECONOMICS

STATIONER, OKLAHOMA, TO R
Agricultural Economics
JAN 1 1981

November 25, 1981

Mr. EDWIN KETCHUM
Duncan, Oklahoma
73533

Dear Mr. Ketchum

Several years ago a group at Texas A&M University estimated the annual cattle losses that would occur in the absence of the screw-worm eradication program. States considered were California, Arizona, New Mexico, Texas, Oklahoma, Arkansas, Louisiana, Tennessee, Mississippi, Alabama, Georgia, North Carolina, South Carolina and Florida. Their estimate that a 1.5% loss in U.S. beef production attributable to screw-worm infestations would occur in the absence of the program, seems conservative. Nevertheless we have used their estimates as a basis for determining economic benefits of the program.

Calendar 1980 is the latest full year for which appropriate data are available. In that year the per capita beef consumption on a carcass basis was 76.5 pounds. The retail price, also on the carcass basis, was \$2.38 with per capita expenditure on beef \$182.07. The Texas A&M estimates suggest a supply of beef, without the screw-worm eradication program, of 75.3 pounds per capita. USDA estimates suggest a 1.537 percent increase in the price of beef at the consumer level for each 1 percent decrease in supply. Using these estimates the estimated retail beef price in the absence of the program would have been \$2.44 or a per capita expenditure for beef of \$183.73.

Thus in the absence of the screw-worm eradication program, consumers would have expended an additional \$1.66 for beef but would have had 1.2 pounds, carcass basis, less available than was actually the case with the program.

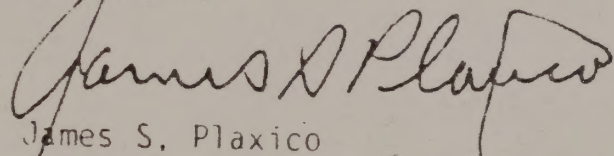
Given the 1980 estimated U.S. population in 1980 of 227.7 million, the total economic benefits of the program to consumers total \$377.9 million. USDA reports an expenditure of \$36.5 million on the screw-worm program in fiscal 1980, suggesting a cost benefit ratio of 10.4:1.

PAGE 2

Obviously the cost benefit ratio of the screw-worm program is highly favorable from the standpoint of consumers. It should be pointed out that in addition to suffering some \$378 million additional expense, consumers would have been forced in 1980 to forego the consumption of the additional 1.2 pounds of beef, carcass basis, if the program had not been operating.

The supporting calculation and data sources for the above estimates are included in the attached table. Bruce Bullock collaborated with me in making the calculations. If you have questions please call or write.

Sincerely,


James S. Plaxico
Professor

JSP:jgb

Enclosure

TABLE 1--ESTIMATE OF THE PROX BENEFITS AND COST:
BENEFIT RATIO OF THE SCREW-WORM ERADICATION PROGRAM

ITEM	ACTUAL 1980	ESTIMATED 1980 WITHOUT SCREW-WORM PROGRAM
Per Capita Beef Consumption (Carcass Basis)	76.5	75.3 ^{1/}
Retail Beef Price (Carcass Basis)	\$2.38	\$2.44 ^{1/}
Per Capita Expenditures on Beef	\$182.07	\$183.73

Program Benefits:

Per Capita	\$1.66
Total	\$377,982,000
Cost/Benefit Ratio ^{1/}	10.4:1

-
- ^{1/} Livestock and Meat Outlook and Situation - USDA LMS-243, Oct. 1981.
- ^{2/} Computed on the basis of estimated marketing reductions due to screw-worm infestations in the absence of the program.
- ^{3/} Based on a price flexibility of - 1.537 from Livestock and Meat Situation LMS-229, Oct 1979, Page 25.
- ^{4/} Based on Fiscal 1981 expenditure of \$36,351,200 as reported to Senator Boren's office by USDA.

This item has been digitized as a selection from the Screwworm Eradication Collection.

Digital Item Number: 00308

Format: Memorandum copy

Additional Format: letter draft

Author: Leo E. LaChance

Additional Authors:

Recipient:

Date: 24 February 1982

Final Draft of Letter to the Editors of "Science"

Note: Enclosure, Letter to the Editor- Science, Technical Comments,
Speculating on Screwworm Speciation, January 22, 1982

Screwworm Eradication Records

Screwworm Eradication Collection

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February 24, 1982

SUBJECT: Final draft of letter to the Editors of Science

TO: R. Bram
R. Gagné
A. C. Bartlett
J. A. Seawright
D. O. McInnis
~~W.~~ H. Graham
C. J. Whitten

Enclosed is a final draft of the ARS response to the Science article by Richardson et al. (22 Jan. 1982). I am very grateful for all your comments, suggestions and discussions relative to this issue. I regret that we could not use all of the material; certainly it was most pertinent. All totaled, your individual comments, revisions and notes that I made during numerous telephone conversations would probably exceed the length of the article. I hope that all of the most important points have been covered, and that the final product meets with your approval. At this time, I am not sure whether APHIS will write a separate letter or not.

Thank you very much for your cooperation and assistance.

LEO E. LaCHANCE
National Technical Advisor
for Insect Genetics

Enclosure

cc: R. C. Bushland
Floyd Smith
H. C. Hofmann
E. F. Knipling
W. Klassen
A. H. Baumhover

LETTER TO THE EDITOR -- SCIENCE

TECHNICAL COMMENTS

SPECULATING ON SCREWORM SPECIATION

Richardson et al. (1) speculate that several species of screwworm flies exist in Mexico. However, the data presented do not prove this hypothesis. Our reservations are based on:

1. The major points that are proposed to support the hypothesis of multiple screwworm "types," which are reproductively isolated, are poorly supported either by original data or by interpretation of existing literature. No substantive numerical data are presented to prove the existence of multiple screwworm species. The methods used to assign a sample to chromosome "types A-J" are not described. The reader has no idea how many samples were taken from each area and, more importantly, the degree of variation which was found between and within types.

2. The structural differences in male genitalia shown in Fig. 7 are not indicative of "different, closely related species" (p. 366), but rather illustrate the effects of the wear and tear of mating and of different viewing angles. Gagné and Peterson (2) found similar differences among sibling males killed before mating and after known numbers of mating opportunities. The assertion that the differences are the sort

found among different, closely related species is unfounded in this family of flies, particularly in the genus Cochliomyia (3).

3. Steady progress has been made in eliminating screwworms from the United States and northern and western Mexico since the expansion of the eradication program. This has occurred without evidence that species or types exist that do not intermate with the released strains.

4. Specimen preparation (fixation, staining) and analysis (stage of cell division) vary considerably even when the same person uses a standard technique. For example, in the differential grasshopper (Melanoplus differentialis), measurements on cells within the same individual or from individuals from one family gave measurements of relative chromosomal lengths taken from electron micrographs with coefficients of variation ranging from 4 to 10% (4). In the flour moth (Ephestia kuehniella), chromosomal measurements from light micrographs gave coefficients of variation of 8 to 20% (5). McInnis et al. (6) used the cytological techniques of Richardson et al. (1) with a sample size of five cells per screwworm larval brain and observed coefficients of variation for standardized chromosome length and arm ratios of about 10 and 20%, respectively.

5. Chromosome polymorphism is not invariably accompanied by genetic isolation. For example, chromosome polymorphism (especially of sex chromosomes) without genetic isolation is found in human populations

where early estimates indicated normal variation of about 3% for the autosomes and a similar 2-3% variation in length of Y chromosomes (7). More recent studies have produced even higher estimates of variation in Y-chromosome length in some human populations (8).

6. Richardson et al. (1) place considerable emphasis on the absence of heterozygotes for various chromosome types in screwworm populations as an indication of reproductive isolation. Evidence for the existence of natural bona fide chromosomal heterozygotes has been provided by McInnis (9) and McInnis et al. (6) who used the same techniques as Richardson et al. (1). Heterozygotes involved mostly the relatively variable X chromosome and were found in frequencies that were lower than those expected from random mating. This reduction in frequency of heterozygotes is not necessarily due to reproductive isolation. In addition to the Wahlund effect mentioned by Richardson et al. (1), inbreeding, heterozygote inviability and other sampling errors may be involved.

It is possible that deficiencies of heterozygotes for chromosome morphs in native screwworm populations are due to the greater difficulty in measuring chromosomal variation within cells than between individuals. A simple experiment would resolve this problem. If chromosome "types" are so readily distinguishable one could establish pure populations of different types, establish the nature of the pure strains (mean chromosome

length $\pm$ standard deviation), then hybridize the populations in reciprocal crosses and examine the hybrids. Although these are accepted genetic practices for the definition of a genetic trait, it appears that the authors have not attempted to strengthen their conclusions by such tests.

Indeed the existence of heterozygotes is not the only crucial test of the hypothesis of reproductively isolated screwworm populations based on distinct karyotypes. Another critical test is whether the same polymorphic non-homologous chromosomes (a specific Y, X, II . . . VI) are consistently associated in diagnostic sets in certain populations to the exclusion of other combinations of non-homologous polymorphic chromosomes. Random mixing of chromosome types would indicate a lack of distinct karyotypes. Thus far, McInnis et al. (6) have found no statistically significant associations among specific non-homologous chromosome types.

7. Samples from the Chiapas field test discussed by Richardson et al. (1) were also analyzed by McInnis et al. (6). Apart from the fundamental differences over the interpretation of the chromosome data, there are other points that should be made. Richardson et al. (1) claim that "Sampling in 1980 and early 1981 indicated no significant differences among frequencies of types of screwworms with time." (p. 367). It simply cannot be assumed that chromosome types remain stable in the

absence of released sterile flies or that all changes in the frequencies of chromosome types are due to released sterile flies. In fact, there is evidence that chromosome types in the Chiapas area were changing during the fall of 1979 and the spring of 1980 in the absence of sterile flies as might be expected from the extreme ecological changes that occur seasonally. Furthermore, data of McInnis et al. (6) suggest that during the Chiapas test changes in the frequency of chromosome types did occur independently of released insects in the center of the control zone.

8. Following the Chiapas test (May-June 1981), during which USDA scientists released sterile flies at relatively low release rates, the V-81 strain was evaluated in the same area at the higher release rates customary for the eradication program. Analysis showed that at sites within the release area sufficiently insulated from immigration of native flies, sterility levels reached 60% and were still increasing after 4 weeks of release. These facts are clearly inconsistent with the claim by Richardson et al. that "strong genetic isolation" (p. 367) exists between the V-81's strain (largely F) and types D and I (supposedly comprising over 70% of the native population). It is also important to note the results of two earlier field evaluations of candidate release strains: (a) in 1979, the irradiated DE-9 strain (east Mexican coast origin) was evaluated in Sinaloa on the western coast of Mexico; and (b)

in 1980, an irradiated Sinaloa strain (west Mexican coast origin) was evaluated in Veracruz on the eastern coast of Mexico. In both tests, the sterility of egg masses collected from a number of different hosts increased from 0 to 70% within 4 weeks. These results demonstrated the ability of sterile release fly strains to suppress native screwworm populations in spite of genetic "mismatches" according to the type classifications of Richardson et al. and provided evidence against the existence of strong reproductive isolation existing among screwworm populations in these areas. A further interesting point is that in the early years of the program in the Southwest (1962-1965) when excellent population suppression was obtained, the release strain consisted of the old Florida strain used in the Southeastern program (1958-1959) and maintained in mass rearing conditions for many years.

9. Despite repeated mention of allozyme differences between screwworm populations, the authors conclude that "the differences are not diagnostic" (p. 366). Here there is agreement. Since 1977, ARS scientists have been routinely sampling native populations of screwworms in the United States, Mexico and Central America to detect the presence or absence of nonrandom mating populations. Isozyme analysis (20 + loci) of insects representing from 50 to 500 native genotypes in each population have not revealed any indication of reproductive isolation or cryptic species among populations from south Texas, from five states in various regions

of Mexico or from western Costa Rica. In fact, the allelic frequencies of the polymorphic systems have been unusually similar in spite of the wide geographic separation and the sampling source (different animal hosts and attractants). At least two of the loci have been diagnostic in the separation of C. hominivorax from C. macellaria in all areas sampled.

10. Richardson et al. (1) indicated that individuals from one of their types would probably mate with individuals of a different type under "unnaturally high densities" (p. 367). Tests conducted in the ARS laboratory at Mission, Texas, with cultures identified as to type by Richardson et al. (1 type F, 1 type H, and 4 type I from northeast Mexico and 1 unknown type from northwest Mexico) have indeed verified this assumption. Data obtained from crosses (P_1 and backcrosses) have indicated no differences in the percent mating occurring among or between types. However, the fertility of eggs oviposited (expressed as percentage hatch) was significantly greater from females mated with males of a different type than from females mated with males of the same type or of the same culture. In the backcross matings, the converse was indicated; fertility and mating were significantly greater among those F_1 progenies of like types.

12. Because all healthy screwworm females normally deposit a first egg mass of 100-300 eggs near a wound, this feature does not help to distinguish types A and F from other types, as Richardson et al. (1) suggest (p. 364). Similarly, most screwworm females deposit small egg masses if disturbed by the host. The size of the egg mass is also influenced by nutrition, physiological stress and age of the female. Under conditions of high temperature and low humidity, exudates from wounds tend to dry faster resulting in the establishment of fewer larvae from normal sized egg masses. Thus, the size of the egg mass and larval infestation are influenced by several variables that can account for differences in these characteristics. Thus, type B is not unique nor recognizable by its "small clutches of eggs" (p. 364). We also doubt that putative screwworm "types" produce wounds with different or no odors. Workers with years of experience (veterinarians, ranchers, and screwworm researchers) believe that the obnoxious odors characteristic of screwworm myiasis vary in their intensity with the microflora of the wound. Screwworm-infested livestock held on manure covered ground are likely to become infected with several kinds of putrefying microorganisms; animals ranging on large, clean pastures are less likely to become infected. Over 40 years ago, Melvin and Bushland (10, 11) noted that screwworms reared aseptically, or near aseptically, did not produce a putrid odor.

13. Because the screwworm populations in the United States and northwestern Mexico no longer exist, neither do the reproductively isolated chromosome "types." If future screwworm cases arise in these areas due to fly or host animal movement, the reinvading populations will be from immigrants further south. Thus, it is a matter of conjecture that the original populations existed as reproductively isolated populations.

We do agree that given an insect population that currently ranges from Central Mexico to Argentina the existence of reproductively isolated populations or of mechanisms favoring nonrandom mating is possible. We further concur that if distinct species, incipient species, or some degree of reproductive isolation exists, it is of utmost importance to identify them as rapidly as possible. We also recognize that if complete reproductive isolation is not found, mating preferences, or ecological types better adapted to survive in different areas, may exist that would require higher numbers of released flies and increase program costs. Laboratory tests have shown that strain 009 (colonized for 4-5 years) mated poorly with strain AC17 (newly colonized) although both strains mated well with several other laboratory strains.

Continued progress in screwworm eradication will not, however, be fostered by postulating species where none exist nor by denying their existence after valid scientific proof has been produced. Continued laborious and exacting studies of the characteristics of populations from various areas will be necessary to provide clear answers to the

existence of different types of screwworms. We feel that the existence of different types has not yet been demonstrated. As Grant (12) aptly pointed out, "The crucial events in the speciation process are the twin developments of ecological and reproductive isolation between populations. However, assessing how this twofold process occurs is fraught with difficulty."

Clearly, the results reported by Richardson et al. (1) and those discussed briefly here illustrate the scientific complexity of the problem of reproductive isolation, real or potential, among natural populations of screwworms. It is equally as complex to transform this information into the technology to be used by the managers of the eradication program.

L. E. LaCHANCE

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References and Notes

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12. P. R. Grant. Am. Scientist 69, 653 (1981).

We thank the following ARS and APHIS, USDA, scientists for reviewing these comments and for their useful suggestions: E. F. Knipling, J. G. Riemann, H. C. Hofmann and D. T. North.



United States
Department of
Agriculture

Agricultural
Research
Service

Southern Region
Oklahoma-Texas Area

Screwworm Research
P. O. Box 986
Mission, Tx. 78572

February 26, 1982

SUBJECT: SWASS Field Tests

TO: Dr. Nazario Pineda V., Director
Dr. Robert Reichard, Acting Co-Director
Comision Mexico-Americana Para
La Eradicacion del Gusano Barrenador
Leibnitz No. 20-12^o Piso
MEXICO 1, D. F.

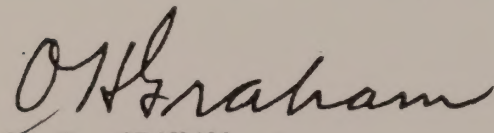
The field tests proposed in my memorandum to you dated February 5 were not completed exactly as outlined in the protocol, primarily because of changes in sterile fly distribution. One field test was completed in the area near Amatlan de Cañas, Nayarit and a report of that test is enclosed. You will note that no real difference was observed in the numbers of sterile flies attracted to the regular pellet and a pellet that contained 23% Swormlure. Significantly more flies were attracted to Swormlure-baited wind oriented traps than to SWASS pellets.

Probably I should refrain from including comments based on ~~empirical~~ observations, but it is our impression that the numbers of flies responding to both the SWASS pellets and Swormlure are low for an area which we are told has been treated with about 6000 flies/sq. mi. for several weeks. We cannot explain these rather low trap catches, but presume that they are due to (1) poor response to Swormlure under those environmental conditions, or (2) poor survival or low vigor of released flies in the zone, or (3) actual releases of sterile flies were lower than programed releases or (4) other factors not yet identified.

You will also note that a check on the physical condition of pellets stored at Tepic indicated that those pellets were in excellent condition. They were quite hard, difficult to break, the bags contained less than 10% broken pellets (broken pellets are usable if the pieces are large), and 6 bags contained less than one pound of fines.

Samples taken in the field have been delivered to Dr. Harold Brown at Weslaco and are presently being analyzed. The results will be forwarded to you as soon as they are available.

We have coordinated our plans with Dr. Chris Hofmann and Jim Bruce and hope to start phase 2 of these field tests next week. Dr. Dennis Ring and Mr. Melquiades Leal are preparing to travel to Guadalajara next week and will propose additional tests to Dr. Asin. A copy of our protocol for phase 2 is enclosed.


O. H. GRAHAM
Location/Project Leader

Enclosures: 2

See attached for distribution

Distribution

cc: N. L. Meyer, ADA, Washington, D. C.
F. E. Smith, C, SV, Hyattsville
R. A. Bram, SS, Beltsville
H. C. Hofmann, Ent. Adv., Mexico City
J. R. Johnston, AD, College Station
H. E. Brown, RL, Weslaco
D. R. Ring, Res. Ent., Mission

Field Observations on Two Swormlure Pellets in Nayarit

Melquiades P. Leal

Bobby D. Handke

Dennis R. Ring

The following is a report of the results of a test of the "super pellet" vs. the regular SWASS pellet in the vicinity of Guadalajara, Mexico.

Seventeen pairs of buckets were suspended in trees on ranches near Amatlan de Cañas, Nayarit, Mexico. Bucket pairs were ca. 1-1½ mi. apart and 1 bucket of each pair was baited with "super pellets" and 1 with regular pellets. Also, 1 wind oriented trap (WOT) was suspended in trees at 9 of the sites but separated by at least 100 meters from the buckets. Traps were suspended in the morning of Feb. 11, 1982, and checked twice a day through Feb. 15, 1982. Buckets were reversed daily at each site. All flies caught in the traps were identified in the field as screwworm, C. macellaria or all other Diptera. Screwworms were identified by sex and as sterile or native.

"Super SWASS pellets" were obtained from Mission, Texas. Regular SWASS pellets were obtained from the distribution center in Tepic, Nayarit. WOT's were baited with Swormlure-2 which had been carried from Mission. Regular pellets from 6 bags at the bottom of 20 bag stacks at the distribution center at Tepic were checked for breakage.

Samples of Swormlure were analyzed at the time of formulation and other samples were collected, and placed in sealed containers in ice when the test began and at the end of the test. Samples of SWASS were collected at the distribution center and other field-exposed samples were taken from the beginning until the end of the test. Upon return to Mission, all samples were given to Paul Thompson and Dr. Brown at Weslaco for analysis.

By statistical analysis, a difference was shown between Swormlure-2 and the two SWASS pellets. WOT's caught more males, females and total flies than "super pellets" and regular pellets. There was no significant difference in the number of flies caught in buckets with "super pellets" and regular pellets. There was no significant difference in the number of flies caught in the morning vs. the afternoon or between days of the test. Native flies were not trapped in this experiment. The data are summarized in Table 1.

Samples of pellets taken from bags at the distribution center in Tepic were in very good shape. At least 90% of the pellets were whole, at most, 10% were broken (but not in small pieces) and less than 1 lb. of dust was collected from all 6 bags. Broken pellets were still usable.

Samples of Swormlure and SWASS are currently being analyzed by Paul Thompson and Dr. Brown.

Table 1. Summary by days of number of flies caught in 17 pairs of SWASS kill buckets and 9 Swormlure-baited wind oriented traps at Amatlan de Cañas, Nayarit, Mexico. 1982.

<u>Super Pellet</u>								
A.M.				P.M.				
Date	<u>Screwworms</u>		<u>C. macellaria</u>	<u>Others</u>	<u>Screwworms</u>		<u>C. macellaria</u>	<u>Others</u>
	♂	♀			♂	♀		
2/11					0	2	0	30
2/12	0	0	0	50	1	4	0	40
2/13	0	7	0	68	1	7	0	11
2/14	0	0	0	10	1	3	0	5
2/15	0	3	0	6	0	2	0	1
=====								
Total	0	10	0	134	3	18	0	87

<u>Regular Pellet</u>								
A.M.					P.M.			
Date	Screwworms		<u>C. macellaria</u>	<u>Others</u>	Screwworms		<u>C. macellaria</u>	<u>Others</u>
	♂	♀			♂	♀		
2/11					0	2	0	77
2/12	1	3	1	28	2	3	0	56
2/13	1	1	1	33	2	2	0	21
2/14	0	0	0	6	1	4	0	15
2/15	2	0	0	5	0	1	0	0
=====								
Total	4	4	2	72	5	12	0	169

Number of Flies in WOT's								
A.M.					P.M.			
Date	Screwworms		C. macellaria	Others	Screwworms		C. macellaria	Others
	♂	♀			♂	♀		
2/11					17	166	2	6
2/12	3	18	0	3	13	33	0	0
2/13	3	33	0	16	4	24	0	2
2/14	4	6	0	2	15	53	0	1
2/15	2	8	0	4	1	9	0	0
=====								
Total	12	65	0	25	50	285	2	9

PROTOCOL FOR SWASS EVALUATION

in Western Mexico, Phase II

March 1982

1. Use kill buckets to measure response of sterile and wild flies to samples of "standard pellet" from storage at a distribution center and ZP-31 pellet carried from Mission.
2. Hang a minimum of 20 pairs of kill buckets in a test area so as to make a direct comparison of the two pellets at each site. Reverse the buckets at each site each day. Check the buckets two times each day and in the same order each time. Run the test in Area A for 4 days and then move to Area B.
3. Hang a minimum of 10 pairs of WOT's in the same general area as the kill buckets, perhaps using the same ranches, but separate WOT's from each other by about 50 meters and from the kill buckets by at least 350 meters. Bait one trap in each pair with SL-ZP-3) and the other with SL-2; reverse the two Swormlures daily. Check WOT's daily. Carry both Swormlures from Mission. Make sure the SL-2 has been analyzed and approved. On arrival at work area, set up 5 bottles of each Swormlure with wick and outdoor exposure (but not in a trap). Stop exposure, cap the bottles, and place in ice chest on following schedule: Day 0, 3, 5, 7, and 9. Modify this schedule to fit travel plans.
4. When kill buckets and traps are checked, count SW flies and identify by sex and whether they are probably sterile or wild. Save all wild flies and all questionable flies and store in liquid nitrogen.
5. If available, collect larvae from any cases in the area and preserve in liquid nitrogen (this is priority 2; do not invest much time in the effort).
6. Probable test areas (this may change after you arrive in Guadalajara):

Area A - vicinity of Barra de Navidad in Jalisco.

Area B - Contact personnel at Guadalajara. - Select an area at least 10 miles x 10 miles where they are having the most screwworm cases.
7. Check with Dr. Asin and others as you go through Guadalajara. Jim Bruce will probably be in Barra de Navidad during first week in March. Leave copy of report of February tests and new protocol with Dr. Asin.
8. Collect samples (6-8 pellets) for SWASS for chemical analysis at Weslaco. Take samples of standard pellets from each bag at the time you open the bag. When you go to distribution center to pickup standard pellets open several bags from bottom of stacks and check for broken pellets and fines. Take samples of SWASS and Swormlure at end of test exposure. Place samples in sealed container in ice chest with dry ice for return to Weslaco.
9. Take literature on dissecting flies to Mr. Bruce.

DRIVE CAREFULLY!

AVOID NIGHTTIME DRIVING!

